

**WASHINGTON STATE DEPARTMENT OF TRANSPORTATION  
SOUTHWEST REGION**

**ROUTE DEVELOPMENT PLAN**

**STATE ROUTE 432  
STATE ROUTE 4 to INTERSTATE 5  
MP 0.00 to MP 10.33**

**Approved By:**

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# **STATE ROUTE 432 ROUTE DEVELOPMENT PLAN**

Prepared for:

**Cowlitz-Wahkiakum Council of Governments  
Washington State Department of Transportation  
Cowlitz County  
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## **SR-432 ROUTE DEVELOPMENT PLAN EXECUTIVE SUMMARY**

This Executive Summary presents the highlights of the Route Development Plan prepared for the State Route (SR) 432 corridor in the Longview/Kelso/Rainier urban area. Included is a discussion of the study methodology, key findings, conclusions and recommendations. The purpose of a Route Development Plan is to outline an action program to address existing and likely future traffic operational and safety issues along a state highway facility.

This study has been conducted in cooperation with the Cities of Longview and Kelso, Cowlitz County, the Cowlitz-Wahkiakum Council of Governments (CWCOG), the Washington State Department of Transportation (WSDOT) and the Port of Longview. The study has also included involvement by a corridor stakeholders group comprised of property owners and major businesses who currently rely on this highway facility.

### **EXISTING CONGESTION/ SAFETY PROBLEMS**

- Most intersections within the SR-432 corridor are currently operating at acceptable levels of service (LOS). However, two problem areas are developing:
  - The intersection of the westbound ramp from Tennant Way to 3rd Avenue operates at LOS D during the evening peak period with certain

turning movements operating at or near capacity.

- The weaving area between the westbound SR-432 on-ramp from I-5 and the off-ramp at Talley Way currently operates at LOS E during the morning peak period.

Existing levels of service for corridor roadways are summarized in Table S-1.

- For the 2001-2003 biennium, WSDOT has identified a High Accident Location within the corridor on the basis of the criteria established for safety project funding. This location is the intersection of Industrial Way with Oregon Way and improvement options are under consideration. There is a perception that some unsafe conditions exist, particularly along the Industrial Way segment between California Way and Oregon Way.
- Frequent rail crossings along the corridor cause periodic congestion problems, particularly along Industrial Way and Dike Road south of SR-432.
- Analysis of truck trips patterns in the corridor indicates that there is a concentration of short trips made in the area along Industrial Way between Tennant Way and Oregon Way. Additionally, there is a significant level of truck activity moving between the SR-432 corridor west of Oregon Way and I-5.

**Table S-1**  
**Existing and 2017 Intersection Levels of Service**

Signalized Intersections							
No. Intersection		1997			2017		
		Avg. Delay (sec.)	LOS	Avg. Delay (sec.)	LOS		
1	SR-432/SR-4	18.8	B	21.7	C		
4	SR-432/38th Avenue	17.6	B	20.4	C		
5	SR-432/Prudential Blvd.	13.0	B	14.1	B		
7	SR-432/Washington Way	26.6	C	36.1	D		
11	SR-432/Oregon Way	26.5	C	70.9	E		
12	SR-432/Columbia Blvd.	5.3	A	16.1	B		
13	SR-432/International Way	5.9	A	7.4	A		
14	SR-432/Fibre Way	12.0	B	22.8	C		
15	SR-432/California Way	15.8	B	20.1	C		
16	SR-432/Industrial Way	7.9	A	15.1	B		
18	SR-432 Tennant Way WB off ramp/3rd Avenue	46.1	D	>80.0	F		
Unsignalized Intersections							
Intersection		Approach	Avg. Delay (sec.)	LOS	Approach	Avg. Delay (sec.)	LOS
2	SR-432/Mt. Solo Road (SRMP 1.21)	SB EBL	5.1 0.2	B A	SB EBL	17.5 4.8	C A
3	SR-432/Memorial Park Drive (SRMP 2.78)	SBLR EBL	4.8 2.8	A A	SBLR EBL	9.9 4.4	B A
6	SR-432/Weyerhaeuser Pulp Gate (SRMP 3.88)	NB SB WBL	7.6 10.7 3.4	B C A	NB SB WBL	>45 >45 5.4	F F B
8	SR-432/Weyerhaeuser-Norpac Entry/Exit (SRMP 4.72)	NB WBL	9.1 3.0	B A	NB WBL	>45 4.5	F A
9	SR-432/Weyerhaeuser/Douglas Street (SRMP 4.85)	NB SB EBL WBL	9.1 9.0 3.6 3.0	B B A A	NB SB EBL WBL	>45 29.9 5.5 4.7	F D B A
10	SR-432/Weyerhaeuser-Norpac Entry/Exit (SRMP 5.95)	NB WBL	9.0 4.0	B A	NB WBL	>45 7.0	F B

Source: Unpublished analysis developed for the *SR-432 Route Development Plan*, WSDOT and Parametrix, Inc.

Note 1: LOS means Level of Service.

Note 2: Intersection on Industrial Way between Oregon Way and 3<sup>rd</sup> Avenue were analyzed using TRANSYT 7F signal progression software.

**Table S-1 Continued**  
**Existing and 2017 Intersection Levels of Service**

<b>Unsignalized Intersections</b>							
<b>No. Intersection</b>		<b>1997</b>			<b>2017</b>		
		<b>Approach</b>	<b>Avg. Delay (sec.)</b>	<b>LOS</b>	<b>Approach</b>	<b>Avg. Delay (sec.)</b>	<b>LOS</b>
17	SR-432 Tennant Way EB ramps/ 3rd Avenue	EBL	25.3	D	EBL	>45	F
		EBR	4.7	A	EBR	6.3	B
19	Talley Way/SR-432 WB Ramps	SBL	2.2	A	SBL	16.9	C
		WBLR	4.7	A	WBLR	>45	F
20	I-5 NB off-ramp/Old Highway 99	SBL	3.2	A	SBL	3.9	A
		EBTR	7.2	B	EBTR	>45.0	F
		WBL	13.3	C	WBL	>45.0	F
		WBR	3.7	A	WBR	4.2	A

Source: Unpublished analysis developed for the *SR-432 Route Development Plan*, WSDOT and Parametrix, Inc.

Note: LOS means Level of Service.

- Other problems in the corridor which were identified by stakeholders included:

- Inadequate directional signing and advance warning of lane changes (especially where the road narrows).
- Provision is needed for safer left turns along Industrial Way west of Columbia Boulevard. Longer left turn pockets are needed at other locations along the street between Columbia Boulevard and California Way.
- Traffic signals along Industrial Way east of Oregon Way need to be interconnected so motorists don't start and stop from one intersection to the next.
- Safe facilities for bicyclists and pedestrians are lacking (some stakeholders also felt it was unwise to provide for bicyclists at all along Industrial Way due to heavy truck traffic).

## **NEW GROWTH AND DEVELOPMENT**

- Significant growth in industrial, commercial and residential development is forecast in the SR-432 corridor by 2017. Retail employment is expected to grow by 60 percent and non-retail employment by less than 50 percent. The existing housing stock is expected to grow by approximately 30 percent.
- Locations where major concentrations of growth are expected are illustrated in Figure S-1.
- As a result of this growth, trip-making within the Longview-Kelso urban area is expected to increase by 46 percent between 1995 and 2017.
- There is no developed access to property south of the SR-432/Talley Way interchange. If access can be achieved, significant economic development opportunities exist.

## **PROJECTED CONGESTION PROBLEMS IN SR-432 CORRIDOR**

- With no major improvement in the existing roadway system, significant congestion problems are expected during the PM peak hour at several locations by 2017. This time period was selected for analysis as it is expected to experience the highest level of congestion over an average working day.
  - While the intersection of Industrial Way with Washington Way is expected to operate at an overall LOS D, many traffic movements would operate at LOS E. These include the eastbound left and westbound through and left, northbound through movements, and southbound left turns.
  - Traffic attempting to exit the Weyerhaeuser facility onto Industrial Way at all four major access roads will experience LOS F conditions. Because these intersections are stop sign-controlled and traffic on Industrial Way is not controlled, it will be difficult to find sufficient gaps in east-west traffic to safely merge. Signalization should be considered.
  - The intersection of Industrial Way with Oregon Way is expected to operate at an overall LOS E with significant delays (LOS F) for most left turn movements and all southbound traffic.
  - Left turns from the eastbound Tennant Way off-ramp onto 3<sup>rd</sup> Avenue are expected to operate at LOS F, while right turns would operate at LOS B.

Traffic exiting the ramp is presently stop sign-controlled and the eastbound left turns would be impacted by the lack of gaps in north-south through traffic movement on 3<sup>rd</sup> Avenue.

- The intersection of the westbound Tennant Way off-ramp at 3rd Avenue is expected to operate at LOS F. Major delays would be likely for north/south traffic on 3rd Avenue and for westbound left turns from Tennant Way.
  - Westbound left and right turns from the SR-432 off-ramp to Talley Way would operate at LOS F with current stop sign control. If this intersection was signalized, traffic would operate at LOS E indicating that this intersection will likely require both signalization and roadway and/or ramp widening to operate at an acceptable level of service.
  - The stop-controlled movements at the intersection of Old Highway 99 with Kelso Drive would operate at LOS F. Signalization of this location should be considered.
- While development of the Alternate Rail Corridor will divert much of the expected future increase in rail traffic crossing SR-432, congestion problems resulting from rail operations will still occur. These problems will likely include:
    - Trains continuing to cross Industrial Way east of Oregon Way that cannot use the Alternate Rail Corridor. These trains will likely result in significant peak period congestion.

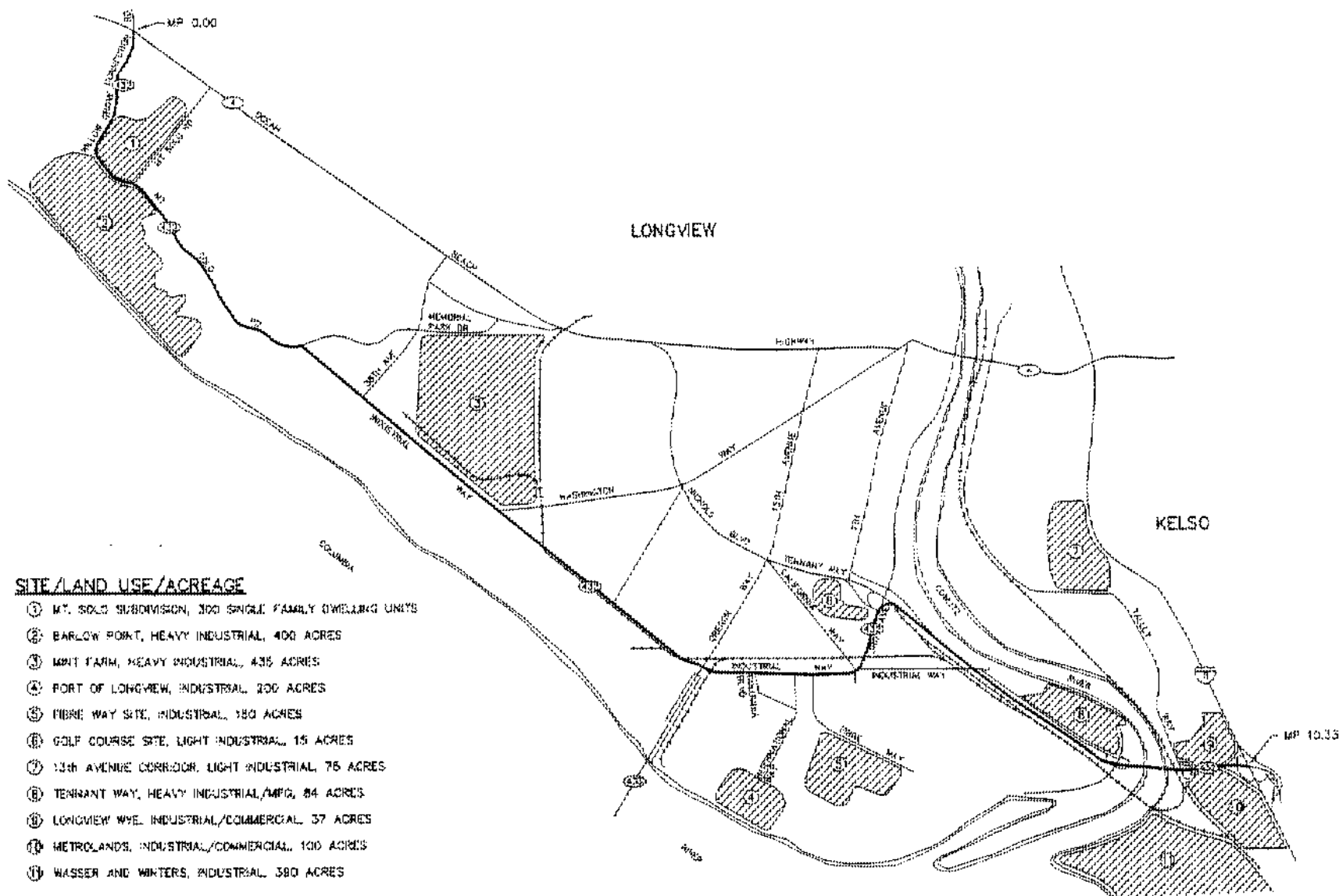
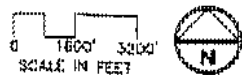


FIG. 1346(2)  
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**Figure S-1**  
**Potential Major**  
**Development Sites**  
SR 432 ROUTE  
DEVELOPMENT PLAN

- With the location of Prudential Steel at the Mint Farm, the number of trains crossing congested roadways in the corridor has increased. Locations specifically impacted are Oregon Way north of Industrial Way and Industrial Way at two locations west of Oregon Way. Both of these locations are expected to be congested by 2017, even without the traffic interruption caused by the trains.
- It will continue to be important to pursue opportunities for grade-separating roads and rail, particularly near the Industrial Way/Oregon Way intersection. Replacement of the Lewis and Clark bridge could offer opportunities to build this grade-separation as a part of the larger bridge project.
- Significant deterioration in traffic operations is expected at the I-5/SR-432 interchange, particularly for the weaving movements between I-5 and Talley Way and for traffic traveling eastbound on SR-432 and entering I-5 southbound.
- Access management measures, including controlling access where feasible to/from commercial and industrial driveways, particularly along the stretch of Industrial Way between 3rd Avenue and Oregon Way.
- Peak period parking and/or turn movement restrictions where necessary to increase capacity for major traffic movements.
- Constructing left-turn channelization west of Columbia Boulevard on Industrial Way where none presently exists.
- Improvements to left turn channelization at selected locations along Industrial Way between Oregon Way and 3<sup>rd</sup> Avenue.
- Install dual westbound left turn lanes at the intersection of Tennant Way at 3rd Avenue.

## **SHORT-TERM IMPROVEMENT OPTIONS**

Several low-cost, short term improvements have been identified for further analysis to help address existing problems and to bridge the gap between the existing roadway system and longer-term improvement needs. These improvements could include:

- Signal progression along major arterials, such as Nichols Boulevard, Oregon Way, Industrial Way, 3rd Avenue and 15th Avenue.
- To develop solutions for the expected location-specific congestion problems in the corridor including Industrial Way west of Oregon Way (with particular emphasis on the intersections at Washington Way and Oregon Way), the 3rd Avenue/

## **LONG-TERM IMPROVEMENT ALTERNATIVES**

A series of major roadway improvement alternatives were explored, refined and evaluated to address the identified traffic deficiencies expected by 2017. These options included many of the improvements identified for the corridor in prior studies, as well as several new concepts. The improvement alternatives were developed in an attempt to address three primary objectives:

- To develop solutions for the expected location-specific congestion problems in the corridor including Industrial Way west of Oregon Way (with particular emphasis on the intersections at Washington Way and Oregon Way), the 3rd Avenue/

Tennant Way interchange area, and the I-5/SR-432/Talley Way interchange area.

- To improve connections between the Longview and Kelso industrial areas and regional access routes such as the Lewis and Clark Bridge and I-5.
- To access industrial property in Kelso south of the SR-432/Talley interchange.

The process of developing and evaluating improvement alternatives included several steps that are documented in greater detail in the SR-432 Route Development Plan Final Report. In summary these steps included:

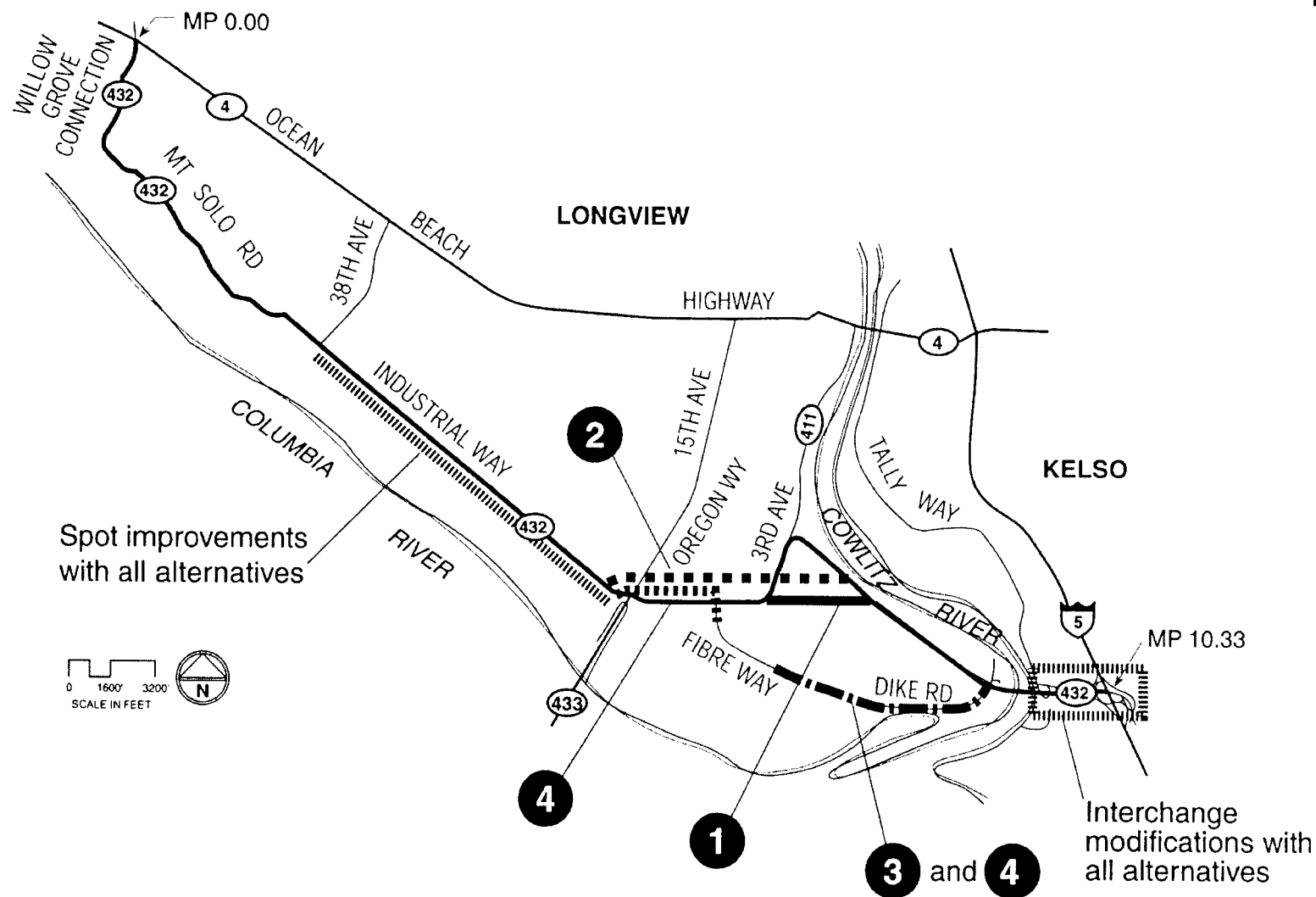
1. Development of goals for corridor improvement and evaluation criteria to assess the relative merits of various improvement options, design concepts and alternatives.
2. Development of a full range of improvement options that were screened to identify those that appeared to have the greatest potential benefit in addressing traffic problems in the corridor.
3. Assembly of improvement options into corridor alternatives. Based on the initial screening of alternatives it became apparent that the corridor should be considered in segments to best define the nature of existing and future problems and to facilitate the development of improvement alternatives. Five segments were identified including:
  - Segment 1 – SR-4 to 38<sup>th</sup> Avenue
  - Segment 2 – 38<sup>th</sup> Avenue to Oregon Way vicinity
  - Segment 3 – Oregon Way vicinity to Tennant Way/3<sup>rd</sup> Avenue vicinity
  - Segment 4 – Tennant Way/3<sup>rd</sup> Avenue vicinity to Cowlitz River Bridge

- Segment 5 – Cowlitz River Bridge to I-5

4. Evaluation of five improvement alternatives including numerous design options and selection of a recommended package of long-term improvements for each corridor segment.

The five improvement alternatives included four in Segment 3 to address existing and future congestion problems along Industrial Way generally east of Oregon Way, and one in Segment 5 that consisted of over a dozen independent design options. The five improvement alternatives are illustrated in Figure S-2 and include:

- *Alternative 1 – Industrial Way Extension:* includes improvements to the intersection of Oregon Way/Industrial Way and extension/improvement of Industrial Way east of 3<sup>rd</sup> Avenue over the Longview Switching Company's rail yard to connect via directional ramps to Tennant Way to the east.
- *Alternative 2 – Industrial Way Bypass:* includes improvements to the intersection of Oregon Way/Industrial Way and construction of a new road between west of Oregon Way and Tennant Way parallel to Industrial Way. This new roadway would be connected to Tennant Way via directional ramps similar to Alternative 1.
- *Alternative 3 – Fibre Way Extension:* includes extension of Fibre Way from its existing terminus near Longview Fibre easterly to the SR-432/Dike Road interchange with options for improvement at the Oregon Way/Industrial Way intersection and reconstruction of the SR-432/Dike Road interchange.



Alternative 1 - Industrial Way Extension  
Alternative 3 - Fibre Way Extension

Alternative 2 - Industrial Way Bypass  
Alternative 4 - Bypass with Fibre Way Extension

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**Figure S-2**  
**Improvement Alternatives**  
SR 432 ROUTE  
DEVELOPMENT PLAN



- *Alternative 4 – Industrial Way Bypass and Fibre Way Extension Combination:* includes elements of both Alternatives 2 and 3.
- *I-5/SR-432 Interchange Area:* More than a dozen design options were identified and evaluated at this location to address existing and potential future traffic weaving problems on SR-432 between I-5 and the Talley Way interchange. Options considered impacts on adjacent developable land, natural resource issues, and the feasibility of new or modified connections to/from I-5.

West of Oregon Way in Segment 2, projected congestion problems were identified and improvement options were assessed including roadway widening, improvements to intersection channelization, and the addition or modification of traffic signals.

Evaluation of each alternative focused on key issues that were identified as important by the Technical and Stakeholder Committees. These included: property impacts, effect to property access, traffic flow, changes in traffic volumes, potential environmental impacts, resolution of existing rail conflicts, and costs.

## **RECOMMENDED IMPROVEMENTS**

In presenting the summary of improvement recommendations for the entire SR-432 corridor, the corridor was divided into five segments from west to east as described above. Improvement recommendations in each of these segments are discussed in the following paragraphs. Levels of service for 2017 PM peak hour conditions with these

improvements in place are presented in Tables S-2 and S-3, respectively.

### **Segment 1 – SR-432 Between SR-4 and 38<sup>th</sup> Avenue**

Analysis of existing and 2017 baseline PM peak hour intersection and roadway levels of service identified no deficiencies in this section. Accordingly, no improvements are proposed. In conjunction with the recommended Industrial Way Bypass in the central portion of the corridor, some increase in 2017 PM peak hour traffic volumes is anticipated in this segment which reduce roadway levels of service to a borderline “D/E” condition. However, given the uncertainties inherent in long-term projections and the marginal nature of the impact, it is not recommended that improvements be undertaken in this segment in conjunction with the bypass. It is recommended that this highway segment be further considered after completion of the bypass when actual traffic diversion from SR-4 and other parallel routes can be observed.

Consistent with the minimum geometric design standards, desirable shoulder width is 8 feet for a minor urban arterial such as SR-432 in this segment. Existing shoulder width varies from 6 to 9 feet with some 3-foot sections. If future improvements are made to SR-432 in this segment, these improvements should include shoulder widening where necessary to meet the 8-foot standard.

Several portions of the existing roadway in this segment may be outside of the existing right of way. These are at station 100+00 lt., station 109+00 lt., and station 129+80 rt. Through prescriptive rights, WSDOT controls the area that must be maintained to

**Table S-2**  
**2017 Highway Segment Levels of Service with Recommended Improvements**

Segment Description	Type	PM Peak Hour Volume		Speed (MPH)		LOS	
		EB	WB	EB	WB	EB	WB
SR-4 to 38 <sup>th</sup> Avenue (SRMP 0.00 - 3.33)	2 lane	390	695	--	--	D	D/E
38 <sup>th</sup> Avenue to Prudential Blvd. (SRMP 3.33 - 3.84)	Arterial	730	815	29	23	B	C
Prudential Blvd. to Washington Way (SRMP 3.84 - 4.43)	Arterial	1,095	1,065	36	40	A	A
Washington Way to Norpac (SRMP 4.43 - 4.72)	Arterial	945	905	37	35	A	B
Norpac to Oregon Way (SRMP 4.72 - 6.05)	Arterial	930	930	38	41	A	A
3 <sup>rd</sup> Avenue U-xing to Tennant Way on-ramp from 3rd Avenue (SRMP 7.64 - 8.17)	2 lane	760	960	--	--	E	E
Tennant Way on-ramp from 3rd Avenue to Bypass Merge (SRMP 8.17 - 9.21)	Multilane	1,340	1,285	55	55	B	B
Bypass Merge to Dike Road (SRMP 9.21 - 9.38)	Multilane	2,390	2,320	55	55	C	C
Dike Road to Cowlitz River Bridge (SRMP 9.38 - 9.58)	Multilane	2,185	2,470	55	55	C	C

Source: Analysis by Parametrix using 2017 PM peak hour forecasts for the Build condition and based on methodologies in the *1997 Highway Capacity Manual*.

Note: LOS means level of service.

preserve the integrity of the roadway, which would be the back of ditch or the end of each drainage structure. Additional right-of-way should not be required until or unless the roadway is widened in the future.

### **Segment 2 – SR-432 Between 38<sup>th</sup> Avenue and West of Oregon Way**

Analysis of 2017 baseline PM peak hour intersection and roadway levels of service identified the following deficiencies:

- SR-432/Weyerhaeuser Pulp Gate (SRMP 3.88) – LOS F for northbound and southbound movements from the minor streets
- SR-432/Norpac (SRMP 4.72) – LOS F for northbound movement
- SR-432/Weyerhaeuser/Douglas Street (SRMP 4.85) – LOS F for northbound movement

**Table S-3**  
**2017 PM Peak Hour Intersection Levels of Service**  
**Baseline Conditions and Recommended Improvement Package**

Signalized Intersections							
No.   Intersection		2017 Baseline		2017 Recommended			
		Avg. Delay (sec.)	LOS	Avg. Delay (sec.)	LOS		
1	SR-432/SR-4	21.7	C	18.2	B		
4	SR-432/38th Avenue	20.4	C	21.1	C		
5	SR-432/Prudential Blvd.	14.1	B	9.6	A		
7	SR-432/Washington Way	36.1	C	42.4	D		
8	SR-432/Weyerhauser-Norpac Entry/Exit (SRMP 4.72)	N/A	N/A	9.6	A		
11	SR-432/Oregon Way	70.9	E	24.4	C		
12	SR-432/Columbia Blvd.	16.1	B	17.7	B		
13	SR-432/International Way	7.4	A	7.2	A		
14	SR-432/Fibre Way	22.8	C	17.5	B		
15	SR-432/California Way	20.1	C	23.7	C		
16	SR-432/Industrial Way	15.1	B	11.8	B		
18	SR-432 Tennant Way WB off ramp/3rd Avenue	>80.0	F	43.3	D		
21	SR-432 (Industrial Way)/Industrial Way Bypass	N/A	N/A	13.8	B		
22	Oregon Way/Industrial Way Bypass	N/A	N/A	24.6	C		
Unsignalized Intersections							
Intersection		Approach	Avg. Delay (sec.)	LOS	Approach	Avg. Delay (sec.)	LOS
2	SR-432/Mt. Solo Road (SRMP 1.21)	SB EBL	17.5 4.8	C A	SB EBL	21.9 4.8	D A
3	SR-432/Memorial Park Drive (SRMP 2.78)	SBLR EBL	9.9 4.4	B A	SBLR EBL	11.2 4.7	C A

Source: Unpublished analysis developed for the *SR-432 Route Development Plan*, Parametrix, Inc.

Note 1: LOS means Level of Service.

Note 2: Intersections on Industrial Way between Oregon Way and 3<sup>rd</sup> Avenue were analyzed using TRANSYT 7F signal progression software.

Note 3: At intersections denoted N/A under “Average Delay” and “LOS” have been modified between the 2017 baseline conditions and the 2017 recommended plan. In some instances the intersection has been signalized, in others the intersection has either been added to the system or eliminated.

**Table S-3 Continued**  
**2017 PM Peak Hour Intersection Levels of Service**  
**Baseline Conditions and Recommended Improvement Package**

<b>Unsignalized Intersections</b>							
<b>No.</b>	<b>Intersection</b>	<b>2017 Baseline</b>			<b>2017 Recommended</b>		
		<b>Approach</b>	<b>Avg. Delay (sec.)</b>	<b>LOS</b>	<b>Approach</b>	<b>Avg. Delay (sec.)</b>	<b>LOS</b>
6	SR-432/Weyerhaeuser Pulp Gate (SRMP 3.88)	NB SB WBL	>45 >45 5.4	F F B	NB SB WBL	N/A >45 7.7	N/A F B
8	SR-432/Weyerhaeuser-Norpac Entry/Exit (SRMP 4.72)	NB WBL	>45 4.5	F A		N/A	N/A
9	SR-432/Weyerhaeuser/Douglas Street (SRMP 4.85)	NB SB EBL WBL	>45 29.9 5.5 4.7	F D B A	NB SB EBL WBL	>45 >45 6.2 6.0	F F B B
10	SR-432/Weyerhaeuser-Norpac Entry/Exit (SRMP 5.95)	NB WBL	>45 7.0	F B	NB WBL	>45 7.4	F B
17	SR-432 Tennant Way EB ramps/ 3rd Avenue	EBL EBR	>45 6.3	F B	EBL EBR	>45 4.9	F A

Source: Unpublished analysis developed for the *SR-432 Route Development Plan*, Parametrix, Inc.

Note 1: LOS means Level of Service.

Note 2: Intersection on Industrial Way between Oregon Way and 3<sup>rd</sup> Avenue were analyzed using TRANSYT 7F signal progression software.

Note 3: At intersections denoted N/A under “Average Delay” and “LOS” have been modified between the 2017 baseline conditions and the 2017 recommended plan. In some instances the intersection has been signalized, in others the intersection has either been added to the system or eliminated.

Roadway improvements for this section are shown on Figures S-3A and S-3B and include the following:

1. Relocation of the Weyerhaeuser Pulp Gate Access currently located at SRMP 3.88 is recommended to be relocated to form the southerly leg of the existing signalized intersection with Prudential Boulevard (SRMP 3.84). The existing approach opposite Interlox is not proposed to be signalized due to low traffic volumes and proximity to the signal at Prudential Boulevard.
2. A second westbound through lane is proposed to be added at the Washington Way intersection to improve east-west traffic flow through this intersection.
3. The existing intersection at Norpac/Weyerhaeuser (SRMP 4.72) is stop sign-controlled for side street traffic and will experience poor levels of service as through volumes increase on SR-432. A signal warrant analysis was conducted based on 2017 PM peak hour traffic volumes. This analysis indicated that peak hour warrants would likely be met at this location, and accordingly, signalization was recommended.

At two locations in this segment, side street traffic volumes are not anticipated to be sufficiently high to trigger signalization or other improvement to projected LOS F conditions during the 2017 PM peak hour. These are located at SRMP 3.88 for the southbound egress from Interlox, and at SRMP 4.85 for the northbound egress from Weyerhaeuser opposite Douglas Street. At the Interlox intersection, no mitigation is reasonably available. At the Weyerhaeuser location, consideration should be given to consolidation of this driveway's function with a signalized access point or to the use of the driveway primarily for right turn egress only (right and left turn entrance could be provided at acceptable levels of service).

These proposed improvements address all of the deficiencies identified in the analysis of 2017 PM peak hour conditions with or without the addition of the Industrial Way Bypass further east. Consistent with the minimum geometric design standards, desirable shoulder width is 8 feet in this segment for a minor urban arterial such as SR-432 between 38<sup>th</sup> Avenue and Washington Way and an urban principal arterial such as SR-432 between Washington Way and Oregon Way. Existing shoulder width varies from 3 to 10 feet. As future improvements are made to SR-432 in this segment, these improvements should include shoulder widening where necessary to meet the 8-foot standard. The addition of bicycle facilities and/or sidewalks in this segment is not recommended.

### **Segment 3 – SR-432 Between West of Oregon Way and Tennant Way/3<sup>rd</sup> Avenue Vicinity**

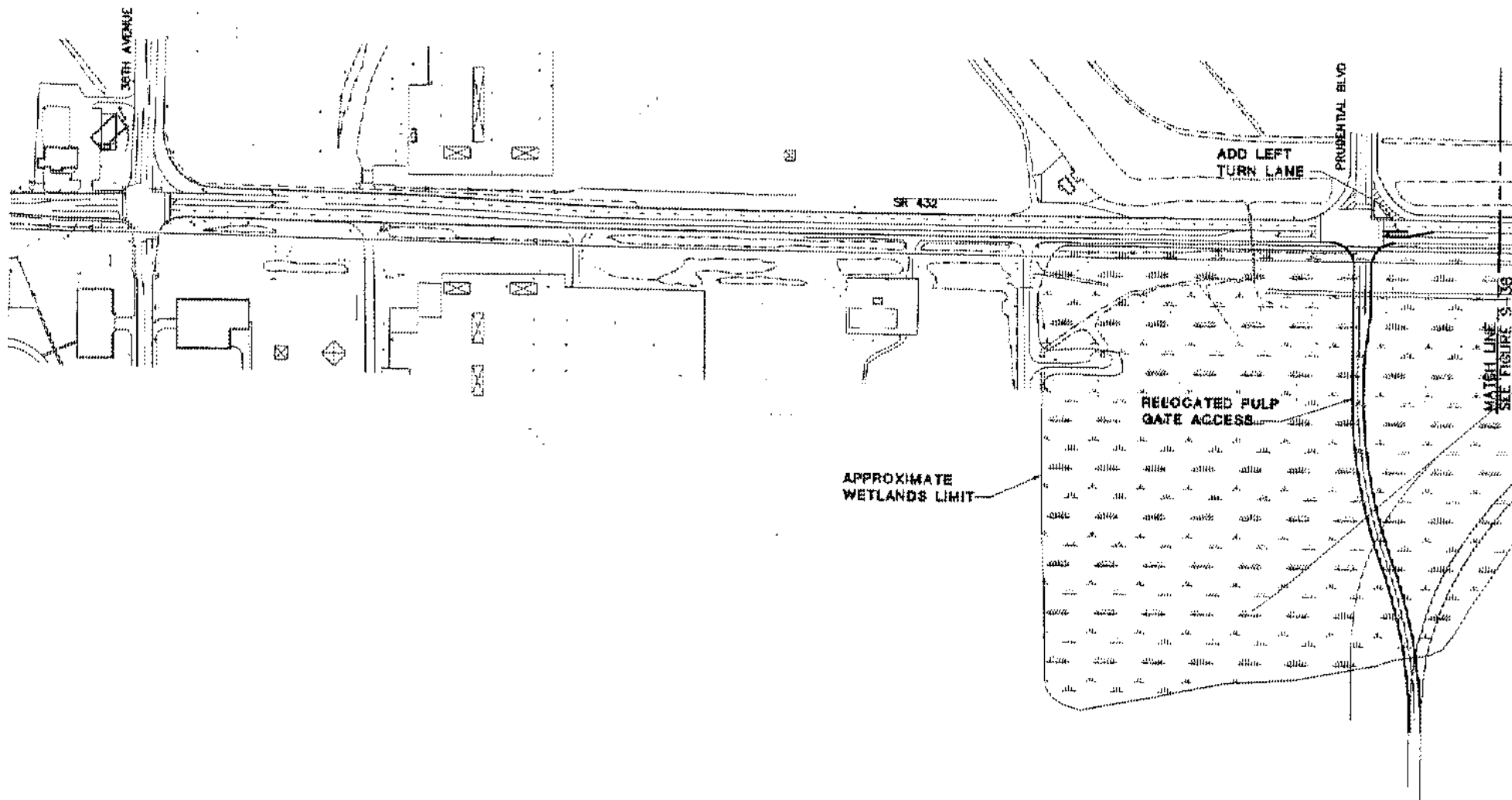
Several locations were identified where improvements would be necessary to address PM peak hour congestion and

circulation problems with the 2017 baseline condition including:

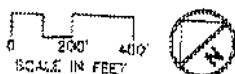
- SR-432/Weyerhaeuser/Norpac (SRMP 5.95) – LOS F for northbound movement.
- SR-432/Oregon Way (SRMP 6.10) – LOS E overall with some movements at LOS F
- SR-432/Tennant Way eastbound ramps to 3<sup>rd</sup> Avenue – LOS F for eastbound left turns onto 3<sup>rd</sup> Avenue
- SR-432 under Tennant Way between the east- and westbound ramps – LOS E
- SR-432/Tennant Way westbound ramps to 3<sup>rd</sup> Avenue – LOS F for overall intersection

To address the deficiencies in this segment, short- and long-term improvements have been recommended. In the short-term, improvements are recommended along Industrial Way/3<sup>rd</sup> Avenue between Oregon Way and Tennant Way to reduce congestion, improve local access and overall traffic operations, and reduce the potential for accidents. The recommended short-term improvements are generally low-cost, transportation system management (TSM) measures which can be funded through various revenue sources, including local agency funds, developer and stakeholder contributions, federal ISTEA grant monies, and state highway improvement funds (where *State Highway System Plan* service objectives are met). Review of existing circulation system issues, deficiencies and potential safety concerns lead to identification of the following short-term improvements:

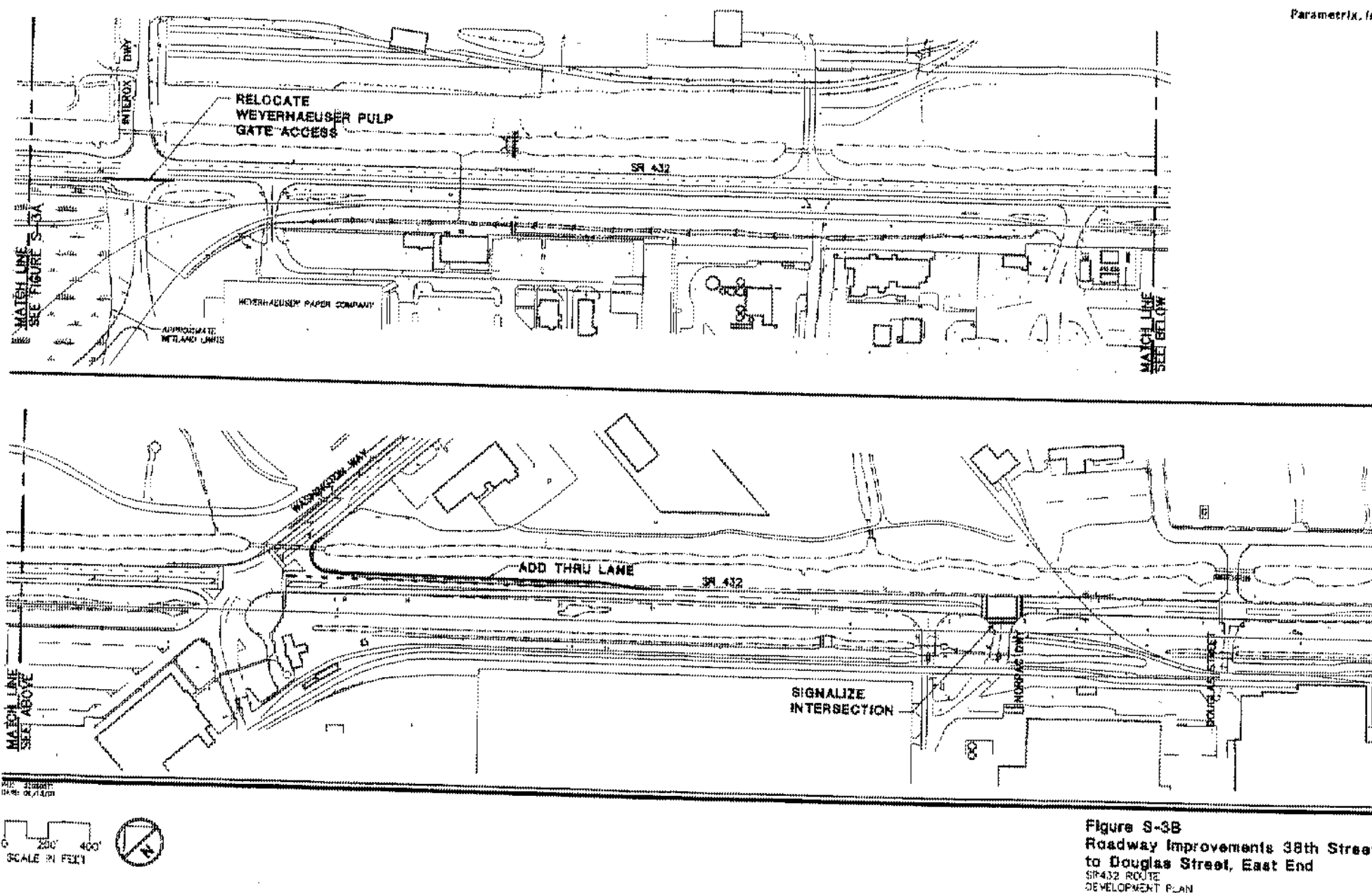
1. *Traffic signal progression enhancements along the 3<sup>rd</sup> Avenue and Industrial Way corridor* to improve the flow of vehicles through the corridor, particularly trucks.



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**Figure 3-3A**  
Roadway Improvements 38th Street  
to Douglas Street, West End  
SR432 ROUTE  
DEVELOPMENT PLAN



2. *Adding a second westbound left turn lane at the intersection of Tennant Way westbound off-ramp with 3<sup>rd</sup> Avenue to improve traffic operations at this location.* This location is a bottleneck, effectively serving as a constraint to the overall movement of traffic from the Port of Longview and neighboring industrial area and I-5. Overall level of service at this intersection is currently LOS D, with some turning movements operating at LOS E. This level of service is expected to degrade to LOS F with additional industrial traffic growth in corridor.
3. *Adding left-turn channelization on Industrial Way from Columbia Boulevard to Oregon Way where no left turn pockets presently exist.* While this location is not currently identified as a High Accident Location or High Accident Corridor as defined by the State Highway System Plan service objectives, it is the only location along the commercial portion of Industrial Way (generally between East Industrial Way and Oregon Way) where left turn channelization is not currently provided. The addition of a two-way left turn lane would provide safer access to adjacent properties, as well as improve left turning traffic operations at the intersection of Industrial Way with Columbia Boulevard.
4. *Improvements to left turn storage at key intersections along Industrial Way.* Analysis of 2017 AM and PM peak period traffic at the intersections along Industrial indicates that, at several locations, the left turn pockets are not long enough to accommodate the projected volume of traffic. These locations include: east- and westbound lefts at Oregon Way, westbound left at Columbia Boulevard, westbound left at

Fibre Way, and eastbound left at California Way. Traffic at these locations should be monitored and the need for extension of existing pavement marking for left turn lanes be re-evaluated on a case-by-case basis. It should be recognized that extension of these lanes will likely require partial restriction of driveway access to locations immediately adjacent to the left turn lane, and the impacts of this trade-off must be considered.

5. Consideration of access management measures along Industrial Way between 3<sup>rd</sup> Avenue and Oregon Way, ranging from peak period turn movement restrictions to driveway consolidation.

To address the long-term deficiencies a new, two-lane limited access roadway is proposed north of and parallel to Industrial Way connecting Industrial Way just west of Oregon Way with Tennant Way, east of 3<sup>rd</sup> Avenue. Proposed improvements are shown on Figures S-4A, S-4B, S-4C and S-4D. The Bypass will be grade-separated at Oregon Way and from California Way to Tennant Way, providing a roadway with no at-grade intersections or rail crossings. The Bypass will connect to Tennant Way via a westbound off ramp and an eastbound on ramp. The existing Weyerhaeuser/Norpac approach just west of Oregon Way (SRMP 5.95) will be relocated to west of the Bypass/Industrial Way connection so traffic from this approach can access the Bypass.

When the Industrial Way Bypass is constructed it should be designated as SR-432 and the existing portion of 3<sup>rd</sup> Avenue/Industrial Way between Tennant Way and just west of Oregon Way (where Industrial Way is joined by the Bypass) should revert to the appropriate local jurisdiction. Consideration should be given



to adding sidewalks along this facility, to instituting access management strategies where and whenever possible, and implementing the other short-term improvement recommendations identified in this Route Development Plan.

#### ***Segment 4 – SR-432 Between Tennant Way/3<sup>rd</sup> Avenue Vicinity and Cowlitz River Bridge***

There are no level of service deficiencies identified for this segment of the SR-432 corridor. This segment is designated as an Urban Freeway/Expressway, providing limited access and high speed service. Connections to and from this type of facility should only be at interchange facilities. There is an existing limited access, at grade intersection at SRMP.8.63 that serves Lakeside Industries and connects to a frontage road paralleling SR-432 along the north side. This frontage road also has alternative access to SR-432 via the Dike Road interchange to the east. As volumes on this section of SR-432 continue to increase, this intersection will likely become a greater operational and safety concern. Local roadway improvements that will lead to closure of this intersection should be pursued.

There is also an existing at-grade rail crossing in this segment of SR-432 at SRMP 8.54. This rail spur line connects the Cytex industrial site with the Longview switching yard and currently carries very low rail traffic volumes. As a part of the Industrial Way Bypass project, this grade crossing will be relocated further west to eliminate the rail/highway conflict for state highway traffic using the Industrial Way Bypass. Traffic continuing further west on Tennant Way toward 3<sup>rd</sup> Avenue would still need to cross this relocated trackway.

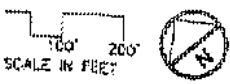
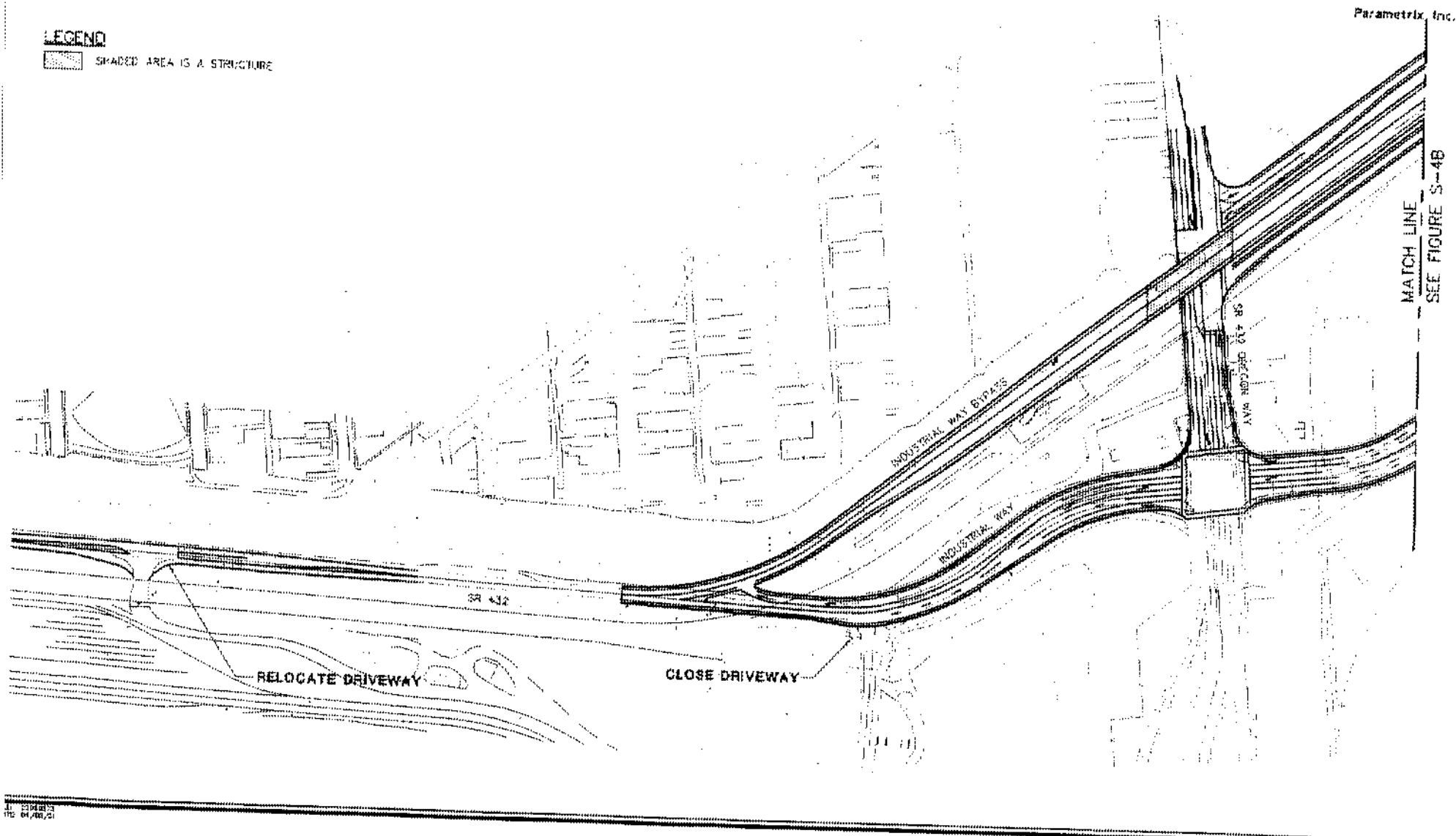
#### ***Segment 5 – SR-432 Between Cowlitz River and I-5***

Based on analysis of existing design hourly traffic volumes, this segment of the SR-432 corridor includes the only currently deficient portion of the highway. This deficiency is located at the westbound weaving area between the I-5 southbound off-ramp to westbound SR-432, and the westbound SR-432 off-ramp to Talley Way. This weaving area is less than 600-feet in length and currently operates at LOS E. By 2017, this location and other in the segment will likely experience LOS E and/or F conditions during peak travel periods. Deficiencies in the 2017 baseline condition are as follows:

- SR-432/Talley Way westbound ramp termini intersection – Future LOS F is expected at this intersection for traffic exiting the off-ramp onto Talley Way. This ramp is currently sub-standard and traffic operations are complicated by the access road that intersects the ramp between the freeway gore point and the Talley Way intersection.
- SR-432, I-5 to Talley Way westbound - LOS F in the weaving area, LOS E in the non-weaving area
- SR-432, I-5 to Talley Way eastbound - LOS E in the weaving area, LOS F in the non-weaving area
- I-5 off-ramp at Old Highway 99 – LOS F for east and westbound traffic at the intersection, including traffic exiting I-5. There are some sight distance issues at this intersection that will be exacerbated by increasing traffic volumes and/or any potential signalization at this location.

**LEGEND**

SHADED AREA IS A STRUCTURE



**Figure S-4A**  
**Industrial Way Bypass**  
**Concept**  
SR 432 ROUTE  
DEVELOPMENT PLAN

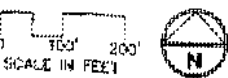
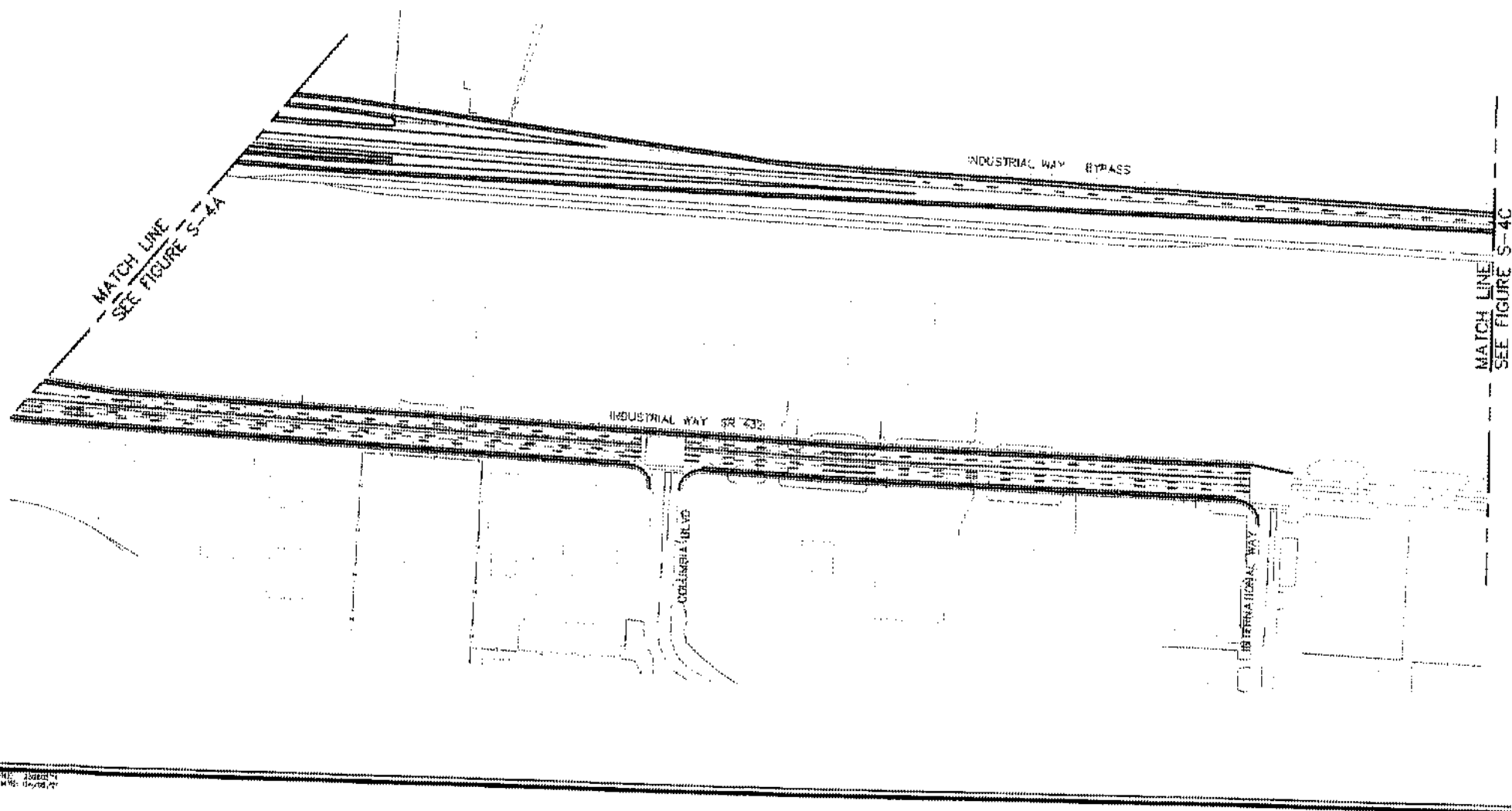


Figure S-4B  
Industrial Way Bypass  
Concept  
SR 432 ROUTE  
DEVELOPMENT PLAN

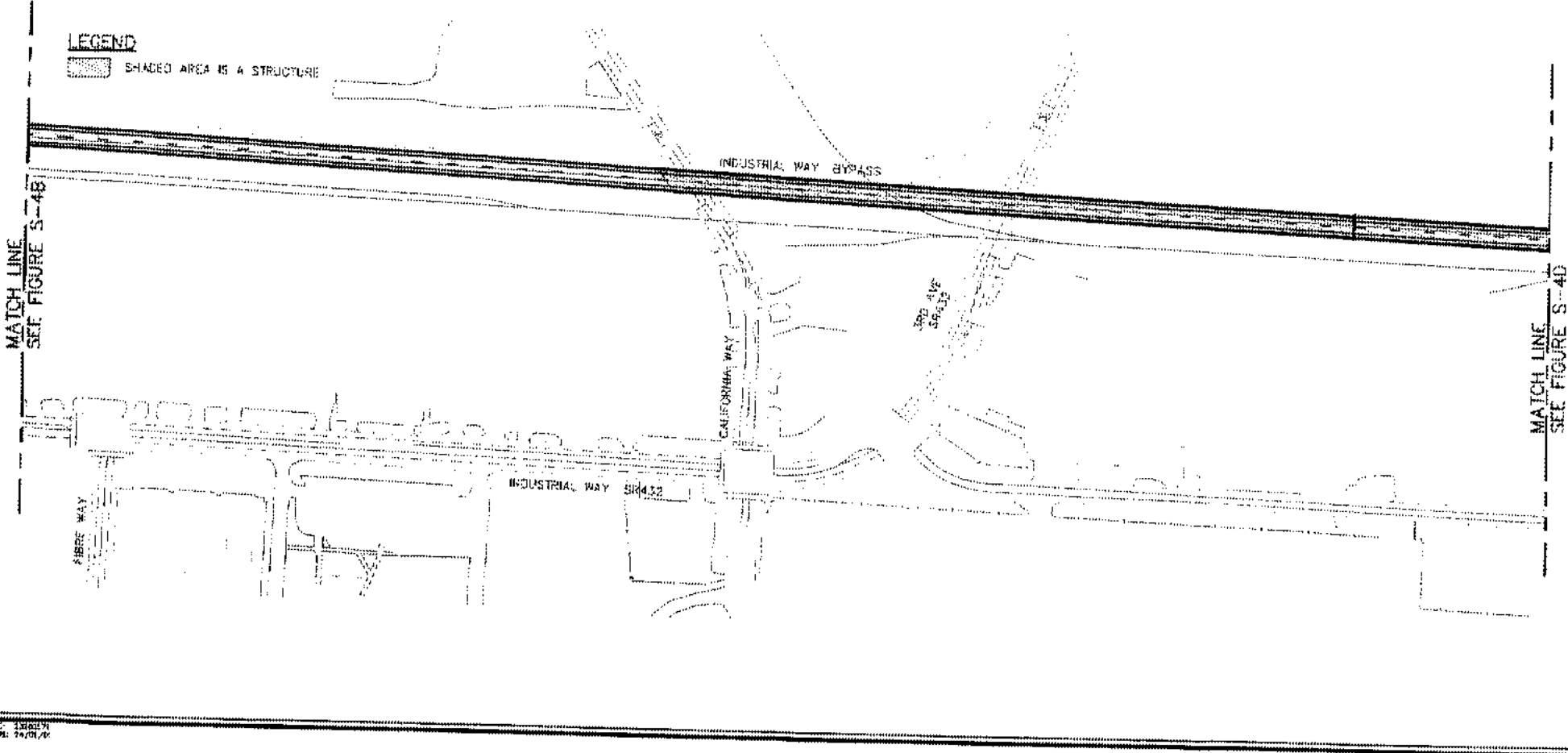


Figure S-4C  
Industrial Way Bypass  
Concept  
SR 432 ROUTE  
DEVELOPMENT PLAN

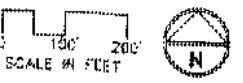
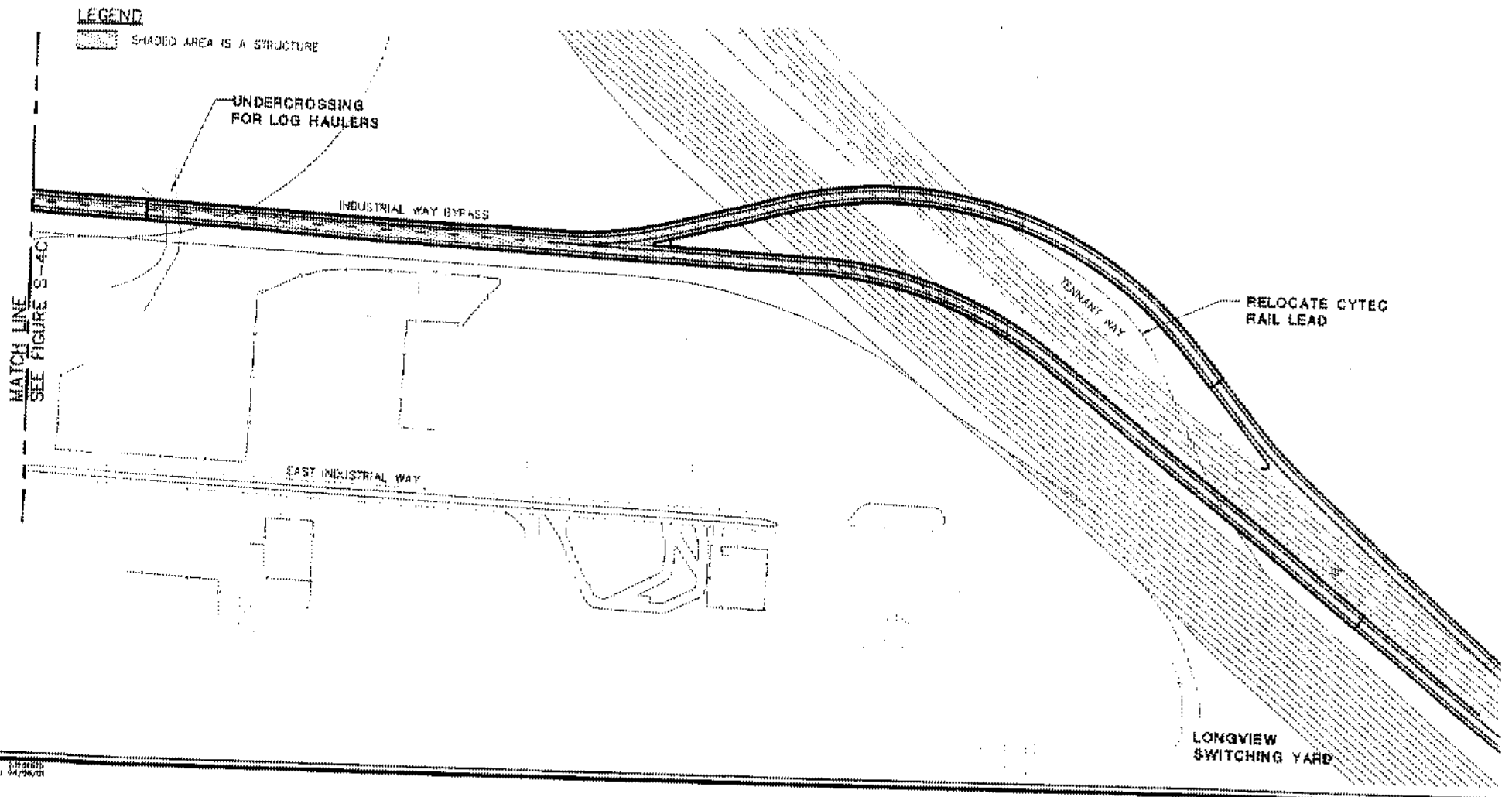


Figure S-4D  
Industrial Way Bypass  
Concept  
SR 432 ROUTE  
DEVELOPMENT PLAN

Numerous alternatives were developed and analyzed to resolve the weaving and intersection level of service problems. The alternatives studied included interchange ramp revisions, several new interchange concepts, removal of the Talley Way interchange coupled with revisions to the I-5/SR-432 interchange to accommodate Talley Way traffic, and modifications to the existing Talley Way and I-5 interchanges. The alternatives generally fell into one of three categories as described below:

- Improvements to existing weaving condition between interchanges through separation of traffic movements.
- Closure of the Talley Way interchange and diversion of traffic via another route to/from I-5 thus eliminating the weaving area.
- Modifications to the Talley Way and/or I-5 interchanges to improve geometrics and traffic operations at both locations.

These options are discussed in greater detail in Appendix E of the full RDP document. Included is an analysis of traffic operations, engineering issues and potential environmental impacts associated with the various options, key findings and conclusions, and recommended future actions.

None of the alternatives studied was able to fully resolve the identified deficiencies and each had potential natural resource, right-of-way, or highway geometric impacts associated with it that made it unacceptable solution from a state and/or local perspective. A major constraint to improvements in this area is the design of the I-5/SR-432 interchange itself. It is anticipated that any final solution to the problems at the eastern

end of SR-432 must include consideration of interchange modifications that may affect existing access to/from I-5.

With the completion of the SR-432 Route Development Plan, a decision was made by the local Technical and Stakeholder Advisory Committees to further evaluate the I-5/SR-432 interchange through preparation of an Added Access Decision Report. Objectives of this analysis would include:

- Resolution of the existing and projected operational deficiencies to reduce delays and vehicular conflicts along SR-432 between the Cowlitz River and I-5, and at the SR-432/I-5 interchange.
- Resolution of deficient roadway geometrics at and near the I-5/SR-432 interchange.
- Reduction of negative impacts associated with delays to freight movement between I-5 and the Longview and Kelso industrial corridors consistent with planned or recommended local improvements.

## **RAIL SYSTEM IMPROVEMENT OPTIONS**

Because of the significance of rail-related safety and congestion/delay impacts on SR-432, one of the objectives of the RDP has been to development recommended improvements to minimize or reduce these impacts. Additionally, with selection of the Industrial Way Bypass as the recommended alternative, potential relocation of the Port Lead track between the Longview Switching Yard and the Port should be considered as a mean of providing the necessary right-of-way for this highway improvement between approximately 3<sup>rd</sup> Avenue and Oregon Way.

Relocation of the rail line may eliminate the need to relocate drainage Ditch Number 3, and its associated costs and right-of-way impacts, in order to provide sufficient space for the new road.

Two primary rail system options were considered to minimize rail and highway conflicts in the SR-432 corridor.

1. The first option is essentially a “Do-Nothing” option where no changes to existing rail trackway and operations would be implemented. This option would do nothing to minimize existing rail-highway conflicts along Industrial Way both east and west of Oregon Way, on Oregon Way north of Industrial Way, and on California Way and 3<sup>rd</sup> Avenue north of Industrial Way affecting traffic operations and roadway safety. However, through construction of the Bypass and its subsequent designation as SR-432, state highway-related traffic would be largely removed from these conflicts. Local street improvements could be made to these crossing locations to enhance safety.
2. The second option involves moving the existing Port Lead track between the Longview Switching Yard and Oregon Way to the Alternate Rail Corridor (ARC). The ARC is being built with two tracks and space for a third under the future Fibre Way overcrossing. This option would require modifications to the Longview Switching Yard and would need to connect to the Reynolds Lead track via a crossing of Oregon Way south of Industrial Way. While Union Pacific railroad representatives indicated that the Reynolds Lead currently carries short trains (5 to 10 cars in length) and normally occupies the crossing for a very short and infrequent period of time,

this pattern could change if traffic presently using the Cowlitz and Columbia Railroad shifts to the Reynolds Lead. Rail traffic that could potentially shift could include that destined for Weyerhaeuser, Prudential Steel, Interlox and other, possible future, users. In the event that this shift in rail traffic should occur, the locations where the Reynolds Lead crosses Oregon Way may require grade-separation to separate rail traffic from vehicular traffic traveling to/from the Lewis and Clark Bridge. This grade separation could require further modifications to the proposed Bypass/Oregon Way interchange.

Changes in the Longview Switching Yard (LSC) that would be necessary with a shift of the Port Lead to the ARC could include:

- Building a wye connection at the south end of the LSC Yard and relocating 11,400 rail feet of track, possibly along the ARC.
- Keeping existing shove access to ARC and adding two tracks on the northeast side of yard to replace lost storage along Port Lead.
- Aligning the northern end of LSC Yard to parallel the Port Lead, eliminating the wye, but avoiding having the bridge piers for the connection between the Bypass and Tennant Way in the yard.

Table S-4 outlines these two rail modification options and identifies potential impacts on rail and highway operations and connectivity.

**Table S-4**  
**Options for Railroad Modification**

<b>Modification</b>	<b>Impact on Highway</b>	<b>Impact on Rail</b>
No change to existing rail track alignment	<ul style="list-style-type: none"> <li>• With designation of the Bypass as SR-432, existing railroad tracks would not cross the state highway at-grade. At-grade crossings would still remain along local streets.</li> </ul>	<ul style="list-style-type: none"> <li>• No change in rail operations, safety issue with existing roadway crossings would remain.</li> </ul>
Move Port lead south to use Alternate Rail Corridor	<ul style="list-style-type: none"> <li>• Eliminates existing railroad crossings on 3<sup>rd</sup> Avenue, California Way, Industrial Way and Oregon Way.</li> <li>• Would require crossing of Oregon Way south of Industrial for Reynolds lead and may require grade-separation at this location impacting the recommended interchange at Oregon Way/Bypass.</li> <li>• Does not affect Columbia &amp; Cowlitz crossing near Washington Way that serves Weyerhaeuser</li> <li>• Would require grade-separation at south end of this intersection.</li> <li>• May impact layout of Bypass in relation to Industrial Way intersection at Oregon.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires replacement of existing train storage north of Industrial Way between California and Oregon Way.</li> <li>• Requires out-of-direction train switching operations in rail yard to access ARC. Tracks in rail yard that serve the Port and others exit rail yard at north end. ARC will exit near south end.</li> <li>• May be acceptable to railroads but requires further study.</li> </ul>

## **SUMMARY OF RECOMMENDED IMPROVEMENTS**

Table S-5 summarizes the improvements recommended for the SR-432 corridor including both short-term (zero to six years) and long-term (six- to ten years) projects. Also included in the table is a summary of estimated project costs, present value costs (reflecting only the 20-year cost of improvements for use in assessing benefit/cost ratios), 20-year benefits that would accrue as a result of the project (including the value of travel time savings and safety enhancements), and a benefit/cost ratio for each project.

## **NEXT STEPS**

A series of future actions have been identified to carry out the recommendations outlined in the SR-432 Route Development Plan. These include:

1. Obtain or initiate development of action plans to secure funding for the future improvements.
2. Initiate tasks leading to construction of the recommended improvements.
3. Secure funding and initiate development of an Added Access Decision Report to address existing and future deficiencies along SR-432 in the vicinity of the I-5 and Talley Way interchanges.



**Table S-5**  
**SR-432 Route Development Plan**  
**Summary of Improvement Recommendations**

<b>Improvement</b>	<b>Rationale</b>	<b>Time Frame</b>	<b>Total Cost</b>	<b>Total Present Value Cost</b>	<b>Total Benefits</b>	<b>Benefit/Cost Ratio</b>
<b><i>Short-Term Improvements</i></b>						
Traffic signal progression along Industrial Way (3 <sup>rd</sup> Avenue to Oregon Way)	To ensure adequate clearance time between intersections reducing rear-end collisions	Underway	\$180,000	--	--	--
Second westbound left turn lane at Tennant Way/3 <sup>rd</sup> Avenue	Improve peak period capacity of intersection	2000-2006	\$182,200	\$182,200	\$5,650,400	31.01
Roadway widening and traffic signal modifications for left turn channelization on Industrial Way (Columbia Blvd to Oregon Way)	Improve safety at intersection and driveways	2000-2006	\$848,400	\$742,266	--	(2)
Restriping for Left Turn Storage Length Improvements, various locations on Industrial Way (3 <sup>rd</sup> Avenue to Oregon Way)	To correct for deficient left turn storage along Industrial Way and improve traffic flow	As needed to accommodate left turning traffic	Nominal	--	--	--
Access management measures, various locations on Industrial Way (3 <sup>rd</sup> Avenue to Oregon Way)	To control turning movements to/from driveways and reduce conflicts with through traffic on Industrial Way	As development opportunities arise	Depends on strategy implemented	--	--	--
<b><i>20-Year Improvement Plan</i></b>						
Prudential Blvd access modifications for Weyerhaeuser	To improve safety and ease of access	2000-2020	\$130,200 (1)	\$31,500	\$124,800	3.96
Industrial Way Bypass (with grade separation over Oregon Way)	To reduce congestion and conflicts between through, local, and rail traffic on Industrial Way	2000-2020	\$66,535,400	\$47,560,000	\$69,714,700	1.47
Second westbound through lane on SR-432 at Washington Way	To add capacity at the intersection	2000-2020	\$413,200	\$378,900	\$496,200	1.31
Install traffic signal at Weyerhaeuser/Norpac entrance (SRMP 4.72)	To provide acceptable level of service for side streets		\$260,600	\$260,600	\$263,000	1.01

(1) WSDOT share of project cost – assumed to include signal modifications and minor intersection channelization improvements.

(2) Benefit/cost analysis for Industrial Way Bypass includes this improvement (Industrial Way widening from Columbia to Oregon).

These action steps are discussed in the following paragraphs.

### ***Secure Funding***

Since SR-432 is a WSDOT facility, all WSDOT funding sources should be pursued. The strategies used will depend very much on the benefit/cost (b/c) ratios of the individual projects. To the maximum extent possible, private or local funding should also be pursued to raise the calculated b/c ratios and make the projects more competitive on a statewide basis. Additionally, if WSDOT builds the Industrial Way Bypass and the existing SR-432 reverts to local governments, the cost of improvement projects in the existing corridor may be locally funded.

### ***Short-term Funding***

A potential funding source for the short-term improvements is the Safety I2 Subprogram - Signals and Channelization subcategory. In order to be funded in this category, applicable warrants must be met. WSDOT funding for projects from this source could be used as a match for grants, such as STP. If local and private funding sources could be identified, this could be a very competitive grant application for short-term improvements to Industrial Way and/or for some of the recommended longer-term intersection and signalization improvements.

### ***Other Funding***

All other WSDOT mobility and safety funding sources are used to address system deficiencies. The one current deficiency on SR-432 is the westbound weave between I-5 and Talley Way. It is recommended that this deficiency and future deficiencies expected to occur at this location be

addressed through an Added Access Decision Report before funding is budgeted for improvements. Analysis of accident history undertaken for the 2001-2003 biennium indicates that the Oregon Way/SR-432 intersection has become a High Accident Location (HAL). Accordingly, funding for improvements at this location could also be sought in the next biennium.

Trade corridor or Freight Mobility funding sources should also be investigated to support improvement projects in the SR-432 corridor. Additionally, consideration should be given to developing options for legislative action. This options could involve both regional and local agencies and private corridor stakeholders.

A briefing paper should be prepared to pursue funding options that outlines:

1. The nature of the recommended improvements.
2. Benefits of the improvements to the community and the statewide transportation system and economy.
3. Costs and cost-effectiveness.
4. Other factors determined to be critical in clarifying the needs of this corridor to legislative and decision-making bodies.

Additionally, local and/or private funding sources should be identified and partnerships formed that can be used to develop a comprehensive and competitive funding package for each improvement.

### ***Tasks Leading to Construction***

Many tasks have been identified that could lead to further advancement of the recommended improvements in the SR-432 corridor. These include:

1. Development of a rail system analysis “booklet” that outlines the options for relocation of the existing Port Lead track. Relocation of this trackage could result in cost-savings for the Industrial Way Bypass due to lower right-of-way costs and could minimize the improvements needed to relocate the drainage ditch adjacent to the proposed project alignment. This booklet should be developed in consultation with Union Pacific, BNSF and Columbia & Cowlitz railroad representatives, as well as the Port of Longview.
2. Initiate preliminary engineering and any necessary environmental review for short-term improvements.
3. As funding becomes available, initiate preliminary engineering and environmental review/permitting for longer-term improvements.

### ***Secure Funding for Added Access Decision Report***

As noted above, none of the alternatives studied for SR-432 in the vicinity of the I-5 and Talley Way interchanges, was able to fully resolve the identified deficiencies. In addition, each had potential natural resource, right-of-way or highway geometric impacts associated with it that made it an unacceptable solution from a state and/or local perspective. A major constraint to improvements in this area is the design of the I-5/SR-432 interchange itself. It is anticipated that any final solution to the problems at the eastern

end of SR-432 must include consideration of interchange modifications that may affect existing access to/from I-5.

At the completion of the SR-432 Route Development Plan, a decision was made by stakeholders to further evaluate the I-5/SR-432 interchange area through preparation of an Added Access Decision Report. Objectives of this analysis include:

1. Resolution of the existing and projected operational deficiencies to reduce delays and vehicular conflicts along SR-432 between the Cowlitz River and I-5 and at the SR-432/I-5 interchange.
2. Resolution of deficient roadway geometrics at and near the I-5/SR-432 interchange.
3. Reduction of negative impacts associated with delays to freight movement between I-5 and the Longview and Kelso industrial corridors consistent with planned or recommended local improvements.

To prepare the Added Access Decision Report, the Cowlitz-Wahkiakum Council of Governments has requested legislative funding for the 2001-2003 Biennium. If funding is obtained, this study could be initiated during the latter half of 2001. The study should be closely coordinated with WSDOT regional and headquarters staff, the Federal Highway Administration (FHWA), and local agencies and stakeholders.

# CHAPTER 1

## INTRODUCTION

### **PURPOSE OF THIS REPORT**

This report documents the study methodology, key findings, conclusions and recommendations of the Route Development Planning study conducted for State Route (SR) 432 in the Longview/Kelso/Rainier urban area. The purpose of a Route Development Plan is to outline a program of actions to address existing and likely future traffic operational and safety issues along a state highway facility. This study has been conducted in cooperation with the Cities of Longview and Kelso, Cowlitz County, the Cowlitz-Wahkiakum Council of Governments (CWCOG), the Washington State Department of Transportation (WSDOT) and the Port of Longview. The study has also included involvement by a corridor stakeholders group comprised of property owners and major businesses who currently rely on this highway facility.

### **STUDY OBJECTIVES**

SR-432 provides for a multiplicity of transportation functions within the Longview/Kelso/Rainier urban area. This facility is a major industrial transportation corridor connecting the Port of Longview and the Cities of Longview and Kelso industrial areas to Interstate 5. As such it serves a high volume of truck trips, averaging between 15 and 25 percent of total traffic through the corridor. SR-432 also connects several communities along the Lower Columbia River to the I-5 corridor including Rainier, Clatskanie and Astoria in Oregon (via U.S. 30 to the Lewis and Clark Bridge/SR-433 over the Columbia River), and Cathlamet and the

Long Beach Peninsula in Washington (via the connection to SR-4).

In addition to moving a high volume of through traffic, SR-432 also provides local access to the industrial and commercial development located adjacent to it. On the portion of SR-432 between Oregon Way and 3<sup>rd</sup> Avenue, conflicts exist between the through-moving and local access functions of this road. SR-432 is also impacted by six at-grade rail crossings, three of which are located in the heart of the study area.

Numerous studies of the corridor have been conducted in the past which have identified a variety of improvement options ranging from low-cost, short-term actions such as access management to long-term, high-cost improvements potentially involving both rail and highway facilities. The Cowlitz-Wahkiakum COG, acting as the Metropolitan Planning Organization (MPO) for the Longview/Kelso/Rainier Urbanized Area has called for preparation of a Route Development Plan (RDP) for SR-432 to integrate this earlier planning effort with the interests of affected stakeholders, reach consensus on priorities, and develop funding strategies for recommended improvements.

Key objectives of this Route Development Planning effort include the following:

- Determine ways to minimize delays to highway freight movement due to traffic congestion and rail activity;
- Accommodate and provide highway capacity for additional truck traffic with

development of existing vacant industrial land within the corridor;

- Plan for the expected increase in traffic growth over the next 20 years;
- Develop effective, feasible roadway improvements to mitigate existing and future traffic bottlenecks;
- Create a circulation network which adequately serves industrial, residential and through travel needs;
- Develop funding strategies for rail and roadway improvements to reduce conflicts between these two transportation modes;
- Accommodate local traffic along the corridor;
- Accommodate the travel needs of residential neighborhoods along the north side of the corridor and protect these communities from intrusion by non-neighborhood traffic; and
- Reach consensus on the prioritization of transportation system improvements;

## **STUDY METHODOLOGY AND DATA SOURCES**

Preparation of the Route Development Plan was conducted in two phases. The first phase included analysis of existing and projected 2017 PM peak hour traffic conditions to determine the nature and magnitude of traffic circulation problems. Phase 1 also laid the foundation for Phase 2 by identifying and carrying out an initial screening of potential improvement options within the corridor, including several proposed in prior studies.

Phase 2 of the study effort included development of a specific action plan for improving traffic circulation and safety in the SR-432 corridor. Phase 2 included the following tasks:

1. Analyze and develop preliminary design concepts, cost estimates and benefit/cost<sup>1</sup> ratios for short-term improvements.
2. Evaluate each long-term alternative from the standpoint of intersection and roadway segment traffic impacts and congestion relief both within and outside the corridor, safety, cost-effectiveness, potential environmental issues, constructibility, integration with rail, land use impacts, and other factors determined to be important in selecting a preferred improvement strategy.
3. Develop design concepts for alternatives and recommended improvements to illustrate key features and potential land use impacts.
4. Develop a financial strategy and phasing plan for implementing the recommended improvements. This phasing plan will be closely tied to expected financial resources and to the improvement priorities recommended in the plan.

Key sources of information used in preparation of the Route Development Plan included previous studies and recommendations related to the corridor, existing and historical traffic volumes, accident data, alignment data, bridge information, roadway and intersection geometric data and traffic control, existing rail operations and improvement plans, and

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<sup>1</sup> Benefit/cost (B/C) ratios were developed using the methodology developed by WSDOT for the *State Highway System Plan*.

land use/demographic data and projections. This information was supplied by the following agencies:

- WSDOT's Southwest Region office which provided traffic counts, accident records and highway geometric data from the statewide TRIPS database;
- The Cowlitz-Wahkiakum Council of Governments, which furnished land use and economic development plans and copies of the numerous prior studies conducted in the corridor;
- The City of Longview which provided historical traffic counts and a copy of the City's *Comprehensive Plan*;
- The City of Kelso which provided traffic count data, prior studies conducted for the Allen Street bridge replacement project, and estimates of development potential for the Cottonwood Island, Metrolands, and Wasser-Winter properties; and
- The Port of Longview which provided numerous prior studies evaluating economic development activities and potential, and identifying rail facility improvements affecting the corridor.

## CHAPTER 2

### HIGHWAY LOCATION, CLASSIFICATION AND FUNCTION

This chapter presents a summary description of the function and policy classifications established for SR-432 including a discussion of the purpose of the highway in relation to the urban transportation system of the Longview/Kelso/Rainier area, functional classifications, freight corridor and national highway system designations, and access management provisions.

#### **HIGHWAY LOCATION AND FUNCTION**

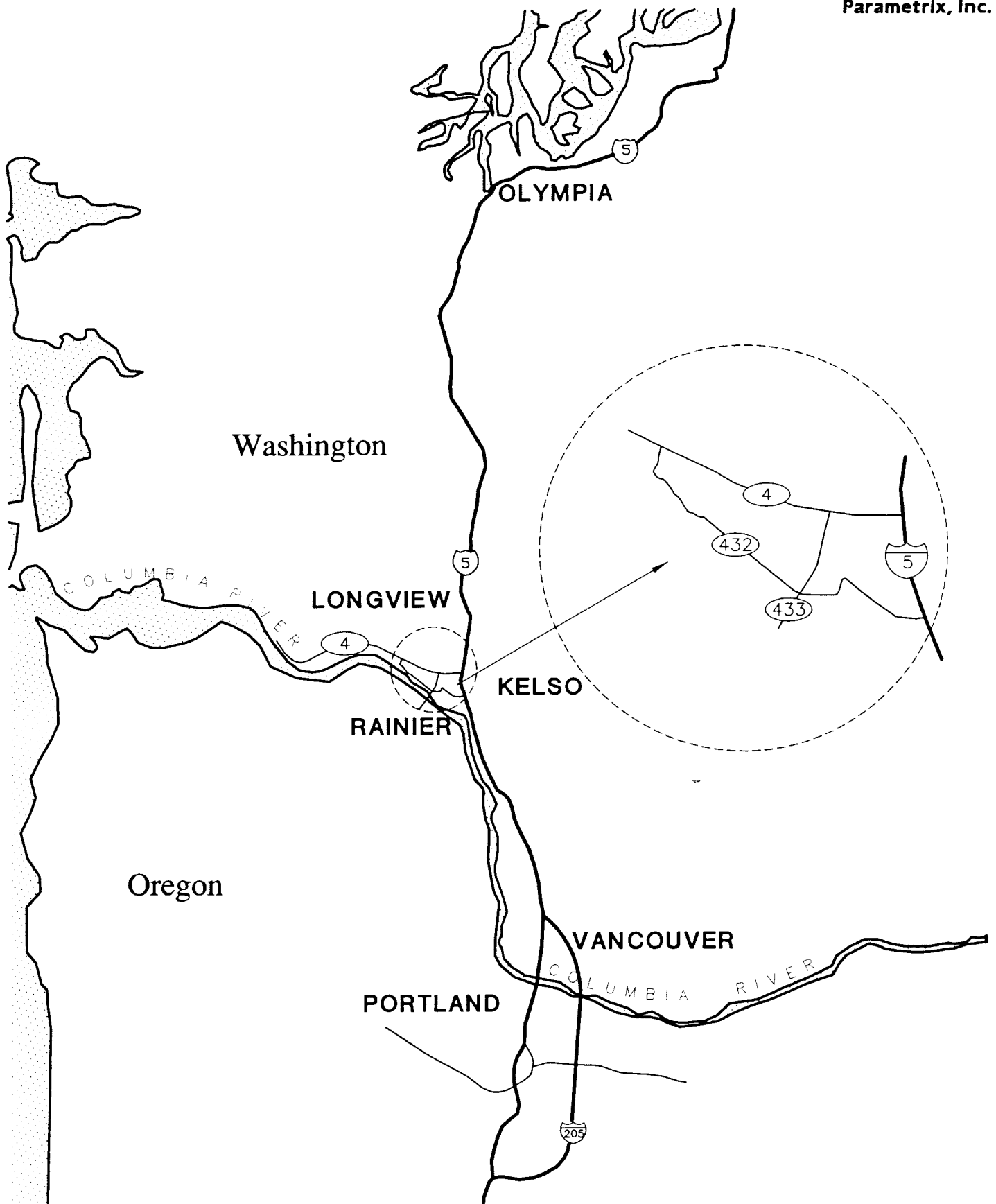
State Route 432 (SR-432) begins with its connection to SR-4 (Ocean Beach Highway) in Cowlitz County west of Longview. From the intersection with SR-4, SR-432 runs 10.3 miles in a southeasterly direction through the Longview industrial corridor parallel to the north shore of the Columbia River, crosses the Cowlitz River, and ends at an interchange connection with Interstate 5 (I-5). Figure 1 depicts the regional location of the SR-432 corridor. The study area is depicted in Figure 2.

Based on the Washington State *Road Jurisdiction Study* conducted by WSDOT in the late 1980s, SR-432 was re-routed from an alignment through Longview along Nichols Boulevard to its current alignment, in order to provide better access for industrial and interstate travel, and to support future access to the undeveloped industrial lands on Cottonwood Island, Metrolands and the Wasser-Winter property in southeast Kelso (see Figure 9).

SR-432 provides a connection from Cowlitz County to Wahkiakum and Pacific Counties via SR-4, and a link between I-5 and northwest Oregon via the SR-433 Lewis and Clark Bridge across the Columbia River to U.S. 30. It serves as an industrial bypass route for the Port of Longview and surrounding industrial area, allowing traffic destined to/from I-5 to avoid traveling through central Longview on SR-4. SR-432 carries interstate commuter, freight and tourist traffic from Oregon via the Lewis and Clark Bridge (SR-433), as well as local traffic to and from the residential area north of SR-432.

SR-432 is an important ground freight corridor, providing a connection between the Port of Longview and the City of Kelso industrial area, and the I-5 corridor. Based on extrapolation of 4-hour counts conducted by WSDOT in 1997 for this analysis, truck traffic comprises 15 to 25 percent of the total daily traffic stream through most of the corridor. Between Oregon Way and Third Avenue (SRMP 6.10 to 7.10), where several major industrial tenants access the corridor including the Port of Longview, truck traffic volumes range as high as 31 percent. There is no current transit service on SR-432. Bicycle and pedestrian traffic is slight; much of the corridor lacks non-motorized facilities, shoulders or sidewalks.

Local access rail service operates through the study area, with two at-grade crossings on the most heavily traveled part of SR-432 (along 3rd Avenue and Industrial Way between Tennant Way and Oregon Way). A spur line continues across Oregon Way and crosses Industrial Way west of its intersection with



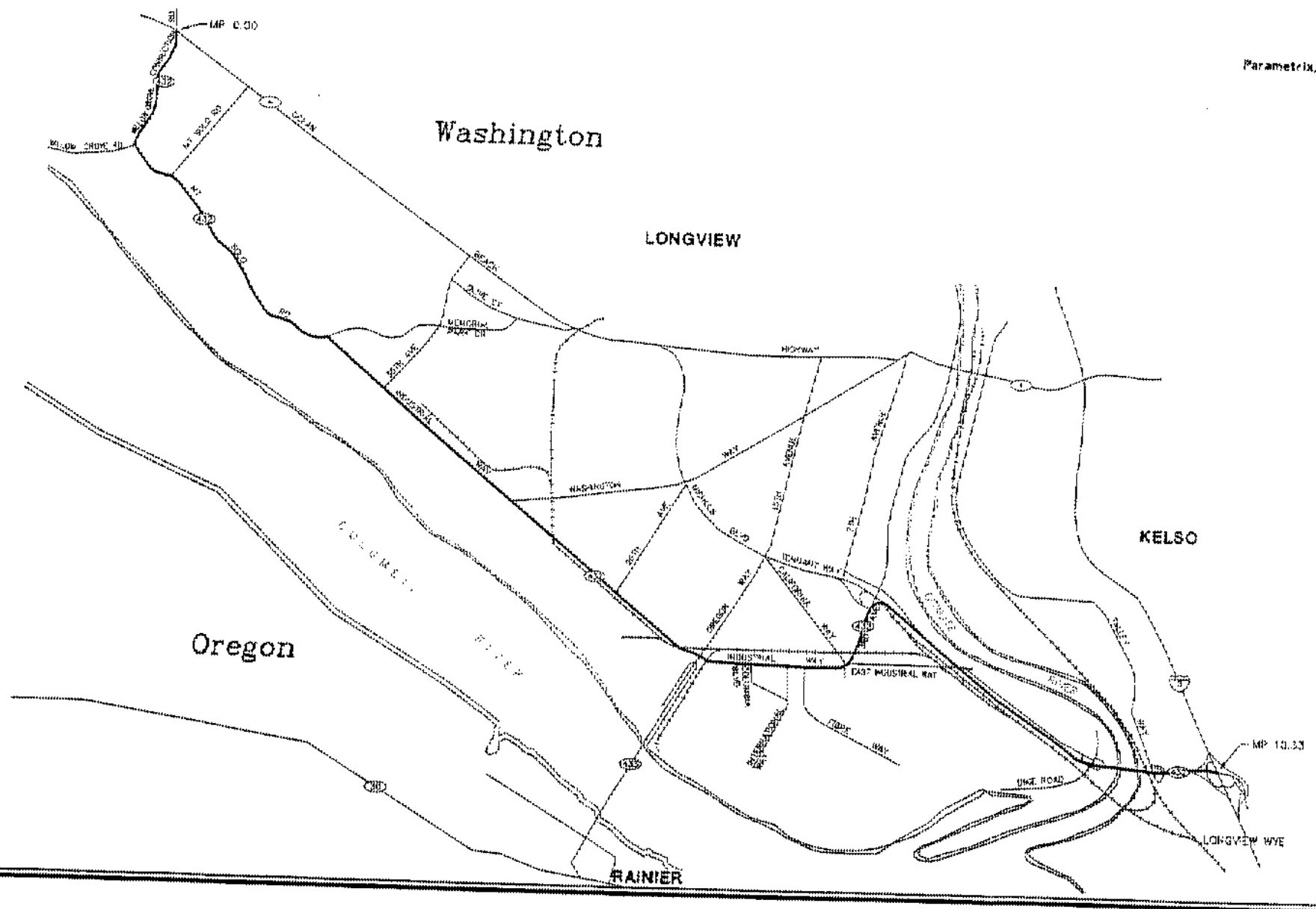
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**Figure 1**  
**Regional Location**  
**of SR-432**  
SR 432 ROUTE  
DEVELOPMENT PLAN

NOT TO SCALE







**Figure 2**  
**Study Area**  
 SR 432 ROUTE  
 DEVELOPMENT PLAN

Oregon Way. Other rail crossings which affect traffic movement to/from the SR-432 corridor include an at-grade crossing located on California Way next to the California Way/3rd Avenue/Industrial Way intersection, a spur crossing near the Weyerhaeuser/Norpac entrance road (east of Washington Way), and another spur crossing of the freeway portion of SR-432 (Tennant Way) in the vicinity of Lakeside Industries. Additionally, there is currently an at-grade rail crossing of Dike Road south of its interchange with the SR-432/Tennant Way and immediately west of the Cowlitz River Bridge. Rail facilities in the corridor have been the subject of recent study due to consideration of the Port of Longview for a new major bulk export terminal and other Port development. Corridor rail travel is discussed in greater detail in Chapter 3.

The export bulk terminal and berth would be served daily by 110-car unit trains. If these trains were to operate on the existing trackway, they would block two SR-432 crossings and the California Way and Dike Road crossings for up to 10 minutes eight times per day (four trains per day, both directions). The trains would create vehicular traffic queues which would take up to 45 minutes to clear during peak periods (*Port of Longview Traffic Impact Assessment*, BRW, Inc, 1997). Today, unit trains make one trip (two crossings - one in and one out) to the area each week (see Figure 5 for the location of existing rail crossings).

To mitigate the impact of the new unit trains on corridor traffic operations at at-grade crossing locations, an alternate rail corridor was identified and will be constructed. The alternate rail corridor is also expected to remove all existing unit train traffic from the

current alignment, reducing travel time delay on SR-432 due to rail operations and lowering the risk of vehicle/rail conflicts.

However, train crossing delays will continue to be experienced along Industrial Way, Oregon Way and California Way due to train activity which are not currently planned for diversion to the alternate rail corridor. This train activity includes all non-unit trains destined for the Port of Longview area, trains to Weyerhaeuser, Reynolds Aluminum, Prudential Steel and many other industrial users in the corridor. It should be noted that development of the alternate rail corridor will not affect the impact of both existing and future train activity at the Dike Road crossing immediately south of SR-432. Dike Road currently serves the County landfill but may serve as a major access route to Cottonwood Island, as well as future connections to the Metrolands and Wasser-Winter properties. Issues related to conflicts between the highway and the rail system will be discussed in greater detail in Chapter 5.

## **HIGHWAY CLASSIFICATIONS**

Table 1 identifies the various classifications that apply to SR-432, which are briefly described below. Following the table is a discussion of the State access management program, and a listing of the access management classifications for SR-432. The federal and state classifications, including major arterial, principal arterial, expressway and freeway, are based on the relative degree of mobility or land access provided by each segment of the road. The other classifications are consistent over the length of the corridor.

**Table 1**  
**SR-432 Roadway Classifications**

Classification Category	Section Description	Classification
Federal Functional Classification	SR-4 to Washington Way (SRMP 0.00 - 4.43) Washington Way to Tennant Way off-ramp at 3rd Avenue (SRMP 4.43 to 7.70) 3rd Avenue to I-5 (SRMP 7.70 to 10.33)	Urban Minor Arterial Urban Principal Arterial  Urban Freeway/Expressway
National Highway System Status	Entire Route (SRMP 0.00 to 10.33)	Route is included in the National Highway System
Highway of Statewide Significance	Entire Route (SRMP 0.00 to 10.33)	Route is included in the system of Highways of Statewide Significance
Freight and Goods Transportation System	SR-4 to Memorial Park Dr. (SRMP 0.00 - 2.78)  Memorial Park Dr. to Oregon Way (SRMP 2.78 to 6.10)  Oregon Way to I-5 (SRMP 6.10 to 10.33)	"T3" route (300,000 to 4 million gross tons annually)  "T2" route (4 million to 10 million gross tons annually)  "T1" route (more than 10 million gross tons annually)
Scenic and Recreational Highway System Status	Entire Route (SRMP 0.00 to 10.33)	Not designated as one of Washington's Scenic and Recreational Highways
Roadside Character	Entire Route (SRMP 0.00 to 10.33)	Urban
Terrain	Entire Route (SRMP 0.00 to 10.33)	Level terrain

Sources: WSDOT TRIPS Database Roadway Classification Log; WSDOT Southwest Region staff, 1999.

Urban Freeway/Expressways are limited access, high speed facilities. Connections to and from the facility are made from on- and off-ramps, and there are no signals or stop signs on the mainline facility. This classification describes SR-432 from the 3rd Avenue/Tennant Way interchange to Interstate 5. SR-432 has one, lightly-used at-grade rail crossing in this segment and at-grade street intersection providing limited turning movements into and out of Lakeside Industries.

Urban Principal Arterials carry traffic through an urban area and connect major elements of the area, such as the Longview industrial corridor and the city core. The state's definition of urban principal arterial

includes freeways and expressways, and applies to SR-432 east of Washington Way to I-5. The federal urban principal arterial classification applies from Washington Way to Tennant Way. Principal arterials frequently have some degree of access control, although direct access to major land use developments such as shopping centers may be allowed. Traffic signals are generally used for intersection traffic control, although the principal arterial segments of SR-432 include a number of unsignalized driveway accesses. Principal arterials typically are at least two miles apart in urban areas.

Urban Minor Arterials carry traffic between principal arterials and lesser classified streets or directly to commercial and industrial areas,

with direct access to land use development generally permitted. Traffic control is commonly a mix of signalized intersections and stop sign control used on intersecting streets of lesser classification. Minor arterials in urban areas are usually separated by less than two miles. Both the federal and state designations for this classification apply to SR-432 from SR-4 to Washington Way.

The entire route is included in the National Highway System. The National Highway System and the Surface Transportation Program are the largest of several categories of federal highway dollars distributed to the states. The entire corridor has also been identified as a Highway of Statewide Significance indicating its importance to transportation movement in the State as a whole. The entire corridor has been classified as urban in the State Department of Transportation's *Roadside Classification Plan*. The Roadside Classification Plan, which includes five character types based on the natural and built landscape, was developed to promote the consistent application of design, landscape and management techniques to similar highway segments.

## **ACCESS MANAGEMENT**

Based on the *State Highway Log* data for SR-432, the number of intersections per mile ranges from two per mile on the west end of the corridor to eight per mile between SRMP 4.00 and 5.00, including intersecting streets, ramps and major driveways. Generally, the number of additional driveways connecting to SR-432 is not significantly greater than the number of access points included in the *State Highway Log*, except for the segment of SR-432 from Oregon Way/SR-433 to 3<sup>rd</sup> Avenue/East Industrial Way (SRMP 6.10 to

7.10). This section has a number of smaller commercial and industrial properties on both sides of SR-432, with a total of over 50 driveways in less than one mile. Much of this segment has a two-way center left turn lane to serve turning traffic. However, in the 1/2 mile span east of Oregon Way from SRMP 6.21 to 6.60, about 30 driveways access SR-432 before the two-way center left turn lane begins east of Columbia Boulevard. This section has one of the higher accident rates in the corridor, as discussed later in this report. This segment also offers potential for application of access management techniques to address existing congestion and safety problems.

Access management techniques include design and operational measures to minimize disruptions to through traffic flow and improve safety. Specific techniques include measures such as reducing the number of driveways, providing adequate space between driveways, establishing minimum spacing for traffic signals and intersections, managing turn movements, and managing the highway median. Access management techniques have been developed to provide a more flexible, cost-effective means of preserving highway capacity than strictly limiting access through purchasing the access rights of abutting properties.

Passage of the "Highway Access Management" law by the Washington State Legislature in 1991 required WSDOT to develop access management rules to be included in the Washington Administrative Code. The rules established a process and associated fees for permitting access onto state highways from private property, and identified a set of five highway access classifications for non-limited access highways.

The five access management classifications assigned to state highways reflect different highway environments, and consider such factors as traffic volume, speed limit, adjacent land use, functional classification, existing access density and accident history. The

specific access management classifications for SR-432 are listed in Table 2 below, followed by a description of typical characteristics of all five classifications. East of 3rd Avenue, SR-432 is a limited access facility.

**Table 2**  
**SR-432 Access Management Classifications**

<b>Section Description</b>	<b>Length (miles)</b>	<b>Access Classification</b>	<b>Speed Limit (mph)</b>
SR-4 to Industrial Way (SRMP 0.00 to 3.00)	3.00	Class 3	45
Industrial Way to 3rd Ave. RR crossing – north of East Industrial Way intersection (SRMP 3.00 to 7.20)	4.20	Class 4	35/45
3rd Ave. RR crossing to SR-5 (SRMP 7.20 to 10.33)	3.13	Limited Access	45/55

Source: WSDOT Southwest Region Office, 2001.

### ***Characteristics of Access Management Classifications***

The following brief descriptions summarize the characteristics of the different access management classifications in the *WSDOT Access Management Plan*. They serve as a reference point for making recommendations regarding capacity and access improvements in the Route Development Plan. Additional information regarding the *WSDOT Access Management Plan* can be found in Chapter 468-52 of the Washington Administrative Code and Chapter 47.50 of the Revised Code of Washington. In all classes, if reasonable access is available from the general street system, then primary property access should be provided from the general street system rather than from the state highway system.

#### **Class 1 Facility**

- High speed, high traffic volumes, long trips

- Service to adjacent land is subordinate to providing service to major traffic movements
- Restricted medians with limited openings and infrequent traffic signals
- Planned intersection spacing = 1 mile. One-half mile spacing permitted when no reasonable alternative
- Minimum private connection spacing = 1,320 feet
- Typically serve speeds of 50 to 65 MPH

#### **Class 2 Facility**

- Medium to high speeds and traffic volumes, medium to long trips
- Direct access to abutting land is subordinate to providing service to traffic movement.
- Median barrier typically used on multi-land facilities. Non-restrictive median or two-way left turn lane may be used where mainline volumes are less than 20,000 ADT.

- Planned intersection spacing = 1/2 mile, intersection spacing should ensure adequate existing and future traffic signal progression
- Minimum private connection spacing = 660 feet
- Typically serve speeds of 35 to 50 MPH in urban areas and 45 to 55 MPH in rural areas

#### *Class 3 Facility*

- Moderate speeds and traffic volumes, medium to short trips
- Reasonable balance between direct access and mobility needs
- Classification used primarily where existing level of development of adjoining land is less intensive than maximum buildout and where probability of significant land use change and increased traffic demand is high.
- Median constructed of curbed asphalt or landscaped traffic islands. Two-way left turn lanes may be used where mainline volumes are less than 25,000 ADT.
- Planned intersection spacing = 1/2 mile, intersection spacing should ensure adequate existing and future traffic signal progression
- Minimum private connection spacing = 330 feet
- Typically serve speeds of 30 to 40 MPH in urban areas and 45 to 55 MPH in rural areas

#### *Class 4 Facility*

- Moderate speeds and traffic volumes, medium to short trips
- Reasonable balance between direct access and mobility needs
- Classification used primarily where existing level of development of adjoining land is more intensive and where

probability of major use changes is less than on Class 3 highway segments.

- Two-way left turn lane is often. Restrictive medians may be used as operational conditions warrant to mitigate turning, weaving and crossing conflicts.
- Planned intersection spacing = 1/2 mile in rural areas. In urban areas intersection spacing should be consistent with ensuring adequate traffic signal progression. Major intersections requiring signalization should occur at a minimum of 1/2 mile spacing.
- Minimum private connection spacing = 250 feet
- Typically serve speeds of 30 to 35 MPH in urban areas and 35 to 45 MPH in rural areas

#### *Class 5 Facility*

- Moderate speeds, moderate traffic volumes, primarily short trips
- Access needs may generally be higher than the need for through traffic mobility without compromising public health, welfare or safety.
- Typically have non-restrictive medians
- Planned intersection spacing = 1/4 mile in rural areas. In urban areas intersection spacing should be consistent with ensuring adequate traffic signal progression. Major intersections requiring signalization should occur at a minimum of 1/4 mile spacing.
- Minimum private connection spacing = 125 feet
- Typically serve speeds of 25 to 35 MPH in urban areas and 35 to 45 MPH in rural areas.

## CHAPTER 3

### DESCRIPTION OF EXISTING FACILITY

This chapter addresses the jurisdictional and physical characteristics of SR-432, including classifications, travel lanes and shoulders, speed limits, rights-of-way, intersection traffic control, location of turn lanes, driveway frequency, bridge information, and locations sidewalks and bike lanes. The chapter discusses previous plans and studies that have been conducted in the corridor or which have bearing on this Route Development Plan. Also included is a summary of existing and future rail facilities and operations in the corridor that impact traffic operations along SR-432. With at-grade crossings at numerous locations, state highway traffic is affected by rail operations to/from the Port of Longview and other industrial properties. Rail movements constrain local circulation, freight movement, and interstate traffic, and cause traffic delay.

#### PREVIOUS PLANS AND STUDIES

The Longview/Kelso/Rainier area has been planning and implementing transportation improvements for better road and rail access for several decades. The following section summarizes the key issues from past studies in the SR-432 corridor in chronological order, and notes recommendations relevant to the highway from these previous studies that have been implemented. The following studies were reviewed as background for the SR-432 Route Development Plan:

- ***Metropolitan Transportation Plan for the Longview-Kelso-Rainier MPO Urban Area, 2nd Draft***, prepared by the

Cowlitz-Wahkiakum Council of Governments, January 1997

- ***Southwest Washington Port Access Study: Final Report***, by BST Associates, January 1997
- ***Kelso Poultry Processing Plant Traffic Impact Analysis***, by the Transpo Group, November 1996
- ***Cowlitz River Crossing Study Summary Report***, prepared by the Transpo Group for the Cowlitz-Wahkiakum Council of Governments, October 1996
- ***The Mint Farm Industrial Park - Supplemental Traffic Study***, by The Transpo Group, Inc., December, 1996
- ***Traffic Analysis for the Mint Farm Industrial Park***, prepared by Richard Carothers Associates for the City of Longview, September 1996
- ***Portland-Astoria Corridor (U.S. Highway 30) Interim Corridor Strategy***, by ODOT, September 1996
- ***Environmental Assessment and 4(f) Evaluation for the Allen Street Bridge Replacement Project***, City of Kelso Public Works Department, July 1996
- ***Alternative Rail Corridor Analysis***, by BRW, Inc., for the Port of Longview, May 1996
- ***Highway 30 Draft Corridor Plan***, Oregon Department of Transportation, July 1995

- ***Final Report: Review of the Port of Longview's Property Acquisition and Development Plans***, BST Associates, July 1994
- ***City of Longview Comprehensive Plan***, prepared by the Cowlitz-Wahkiakum Council of Governments, 1993
- ***Market and Infrastructure Feasibility Analysis for Longview-Kelso-Kalama Industrial/Commercial Sites***, by BST with Robert E. Meyer, September 1993
- ***Lewis and Clark Bridge Origin/Destination Survey***, 1990
- ***SR-432 Corridor Planning Study***, Cowlitz-Wahkiakum Council of Governments, June 1989
- ***South Kelso-Longview Wye Access Report***, 1980
- ***Origin-Destination Survey of Kelso Longview Urban Area***, Cowlitz Regional Planning Commission, 1962

A number of the recommendations from these previous studies have been implemented, including construction of Industrial Way, rerouting of SR-432 to bypass downtown Longview and better serve the Longview industrial area, improvements at the Oregon Way/Industrial Way intersection and various signalization and turn lane improvements throughout the corridor. Major issues raised in these studies which are still outstanding and will affect the SR-432 RDP include:

- The need for additional capacity across the Cowlitz River and its associated benefits to traffic movement along SR-432;

- The need for reconstruction of the Lewis and Clark Bridge across the Columbia River;
- The need to provide access to the undeveloped industrial lands in southwest Kelso near the Longview Wye;
- The ability of two lanes on SR-432 west of Oregon Way to accommodate future travel demands with the development of the Mint Farm, the Village at Mt. Solo and other potential development sites which could increase traffic flow through the corridor; and
- Resources to fund transportation improvements in the corridor.

A more detailed description of key findings, issues and recommendations associated with these prior studies is included in Appendix A.

## **LANE AND SHOULDER CONFIGURATION**

This section summarizes information available in greater detail in the WSDOT *State Highway Log*, as supplemented with field observations. The SR-432 cross-section varies from two lanes (one in each direction) to five lanes (two in each direction with a center two-way left turn lane). The roadway width ranges from 24 to 72 feet, with lane widths generally between 11 and 13 feet. Shoulders widths range from no shoulder (generally on bridges), to 10 feet in width and include paved and gravel surfaces. The roadway cross-section is described in the following paragraphs and summarized in general terms in Table 3, including the location of intersection turn lanes.



**Table 3**  
**Summary of Existing SR-432 Roadway Geometrics**

Section Description	Traffic Lanes	Shoulder	Channelized Intersections
SR-4 to 38th Avenue 45 mph posted speed (SRMP 0.00 to 3.30)	2 thru lanes	Predominantly 6' to 9' paved shoulders, as narrow as 3'	- SR-4 (SRMP 0.0) - Willow Grove Road (SRMP 0.84) - Reynolds Aluminum Co. entry (SRMP 2.87) - 38th Avenue (SRMP 3.30)
38th Avenue to Washington Way 45 mph posted speed (SRMP 3.30 to 4.43)	3 thru lanes (2 westbound/1 eastbound) with 2 way left turn lane	Ranges from 3' to 9', primarily gravel surface	- Reynolds Aluminum Co. entry (SRMP 3.39) - Prudential Blvd. (SRMP 3.84) - Interlox/Weyerhaeuser Pulp Gate (SRMP 3.88) - Washington Way (SRMP 3.88)
Washington Way to SR- 433 45 mph posted speed (SRMP 4.43 to 6.10)	2 thru lanes	Ranges from 4' to 10', primarily paved surface	- Weyerhaeuser-Norpac Co. entry (SRMP 4.72) - Douglas Street (SRMP 4.85) - 26th Avenue (SRMP 5.36) - SR-433 (SRMP 6.10)
SR 433 to east of Columbia Blvd. 35 mph posted speed (SRMP 6.10 to 6.60)	4 thru lanes	0', road edge is curbed with no on-street parking	- Columbia Way (SRMP 6.44)
East of Columbia Blvd. to west of California Way 35 mph posted speed (SRMP 6.60 to 6.98)	4 thru lanes 2-way center left turn lane	0', road edge is curbed with no on-street parking	- International Way (SRMP 6.68) - Fibre Way (SRMP 6.80)
West of California Way to Tennant Way overcrossing 35 mph posted speed (SRMP 6.98 to 7.64)	4 thru lanes	0', road edge is curbed with no on-street parking	- California Way (SRMP 7.04) - Industrial Way/3rd Avenue (SRMP 7.10)
Tennant Way overcrossing to I-5 55 mph posted speed (SRMP 7.64 to 10.33)	4 thru lanes center median	10' paved surface	- Tennant Way Wye (SRMP 8.63); remainder of segment is access- controlled

Source: *WSDOT State Highway Log*, 1997, updated to reflect roadway improvements made in 1998.

As noted in Table 3, the route cross-section varies from two to five lanes. It is a two-lane highway between SR-4 and 38th Avenue (SRMP<sup>2</sup> 0.0 to 3.30), widening to two eastbound through lanes and one westbound through lane with a two-way left-turn lane from 38th Avenue to Washington Way (SRMP 4.43).

<sup>2</sup> Note: SRMP means State Route Milepost.

East of Washington Way, SR-432 narrows to two lanes until Oregon Way (SRMP 6.10). Immediately east of Oregon Way the roadway has two lanes in each direction (with a pavement width of 48 to 50 feet) to a point just east of the intersection with Columbia Boulevard (SRMP 6.64). From this point, the paved roadway cross-section widens to include a center two-way left turn lane, creating a 5-lane section which allows turns into the numerous driveways in this segment.

The five lane cross-section has a paved width of approximately 62 feet with curbs and no shoulder. Just west of California Way (SRMP 6.98), the center turn lane is dropped and the highway again has four lanes with 50-70 feet of pavement, curbs, and no shoulder. The four-lane section continues to the Tennant Way on-ramp (SRMP 7.51), where it becomes a four-lane, limited-access facility extending to I-5 (SRMP 10.33) with a total lane width of 68 feet including a 14-foot median. The section of SR-432 (3rd Avenue) between the eastbound and westbound ramps to Tennant Way has a single through lane in each direction with turn channelization.

The posted speed limit on SR-432 ranges from 35 to 55 mph. It is 45 mph in the western end of the corridor from SR-4 to SR-

433/Oregon Way (SRMP 6.10), where it decreases to 35 mph. From the Tennant Way/3rd Avenue interchange (SRMP 7.64) to the end of the route at I-5 (SRMP 10.33) the posted speed is 55 mph, except for the easternmost 0.04 miles, where the speed is reduced to 45 mph through the I-5 interchange.

Figures 3A, 3B and 3C illustrate significant roadway features including key intersections, railroad crossing locations, lane channelization, pavement and right-of-way width, access management categorization and federal functional classification. Table 4 summarizes minimum geometric design standards as identified in the WSDOT *Design Manual*.

**Table 4**  
**SR-432 – Minimum Geometric Design Standards**

Design Features	SR-4 to Washington Way	Washington Way to Tennant Way/3 <sup>rd</sup> Avenue	3 <sup>rd</sup> Avenue to I-5
Travel Lanes – number – width	2 12 feet	4 12 feet (1)	4 or more divided 12 feet
Shoulder Width – right of traffic – left of traffic	8 feet	8 feet (2)	10 feet 4 feet for 4 lane road
Median Width	None	2 feet	16 feet
Right-of-Way Width	80 feet	80 feet	(3)

Source: WSDOT, *Design Manual*

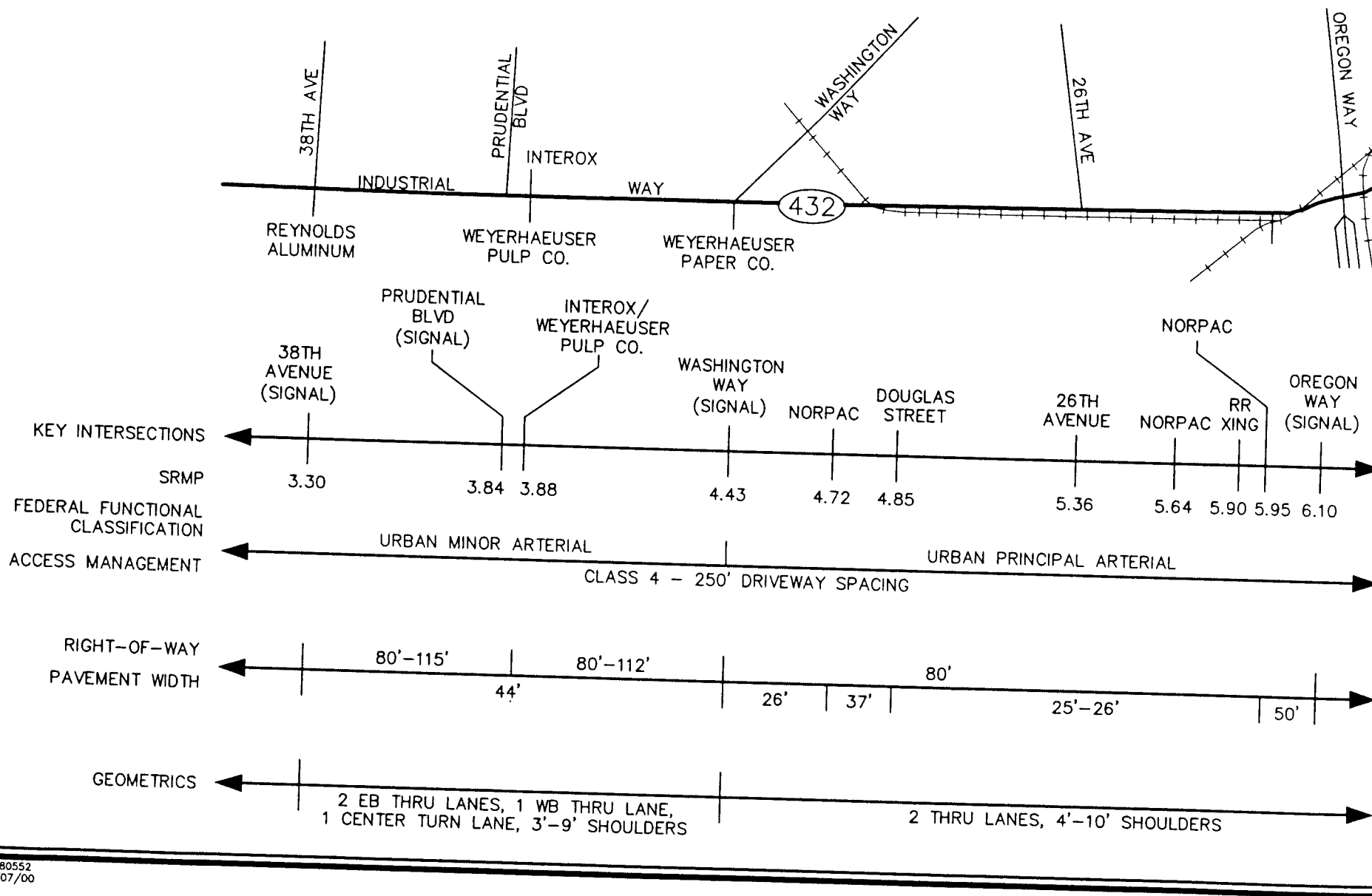
- (1) Truck volumes greater than 6 percent of design hourly volume.
- (2) When curb section is used, a 6 feet shoulder outside the face of the curb is acceptable.
- (3) Minimum necessary to accommodate cross-sectional requirements.

## **EXISTING RIGHT-OF-WAY**

Right-of-way along SR-432 varies greatly from the two-lane road at the west end of the corridor to the multi-lane, urban freeway at I-5 on the corridor's eastern end. Right-of-way information for state highways is not computerized in the WSDOT TRIPS

database. A thorough search of both the WSDOT Southwest Region and Olympia Service Center records would be necessary to collect construction plans, deeds or other acquisition instruments documenting ownership before any widening projects could occur on SR-432.

Figure 3A

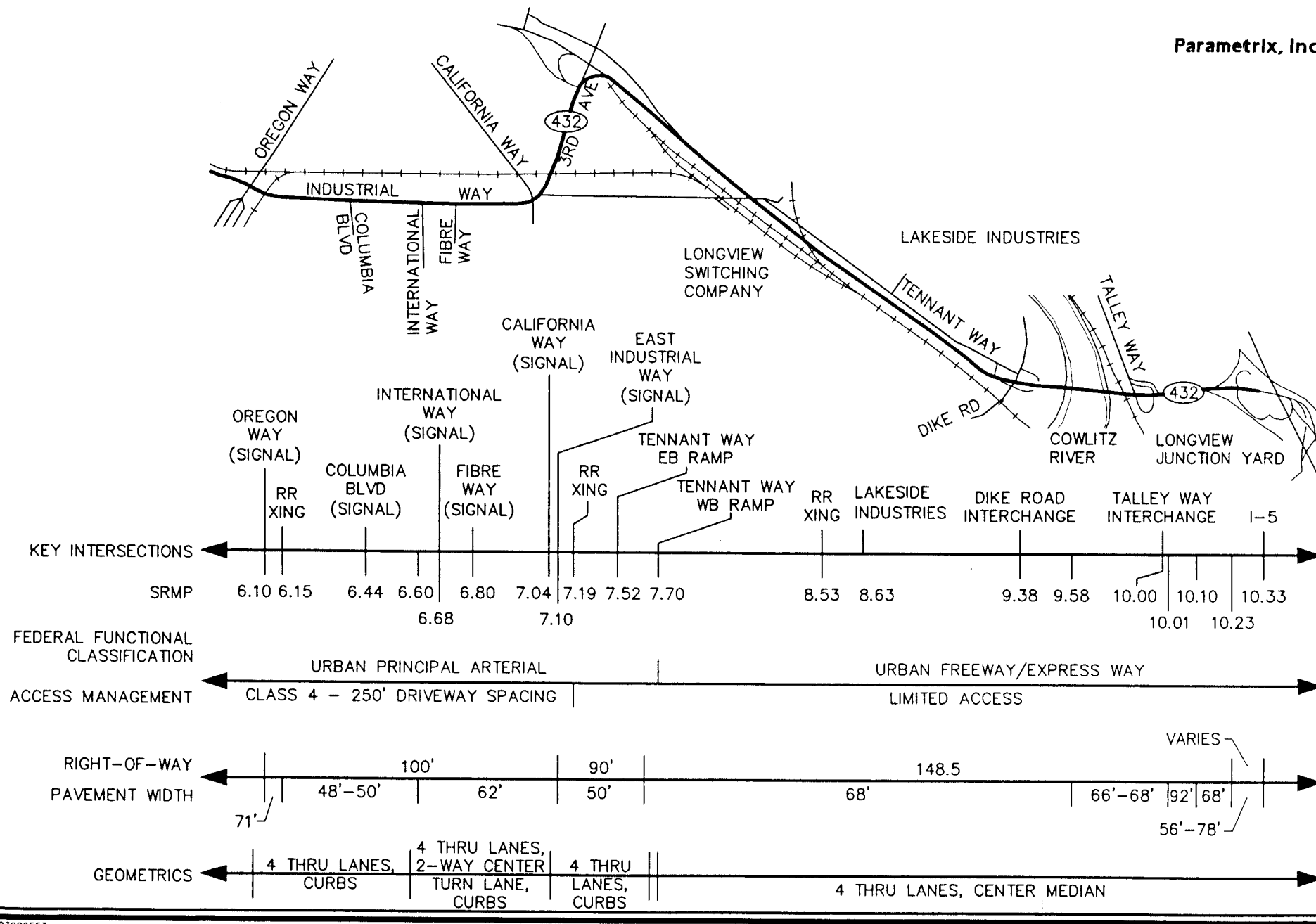


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NOT TO SCALE

**Figure 3-B**  
**SR-432 Roadway Features**  
**Central Portion**  
SR 432 ROUTE  
DEVELOPMENT PLAN



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NOT TO SCALE

**Figure 3-C**  
**SR-432 Roadway Features**  
**East End**  
SR 432 ROUTE  
DEVELOPMENT PLAN

The section of the corridor from SRMP 0.00 at SR-4 to SRMP 7.64 at Tennant Way was transferred to the State via quit-claim deed in 1991 following the *Road Jurisdiction Study* referred to earlier in this document. An additional search of City and County records would likely be necessary to construct projects in this section of the corridor.

Generalized right-of-way information is presented in Figures 3A, 3B and 3C. Right-of-way width varies considerable throughout the corridor, ranging from a minimum of 60 feet to over 400 feet. At the west end of the corridor (near the intersection with SR-4), right-of-way width varies from 65 feet to over 400 feet where a portion of the road runs along the top of or adjacent to a drainage district dike. Several portions of the existing roadway in this area may be outside of the existing right-of-way (stations 100+00lt., station 109+00 lt., and station 129+80 rt.) Through prescriptive rights, WSDOT controls the area that must be maintained to preserve the integrity of the roadway, which would be the back of the ditch or at the end of each drainage structure. Additional right-of-way should not be required until or unless this portion of the roadway is widened in the future.

Between Memorial Park Drive and 38<sup>th</sup> Avenue, right-of-way width varies from 80 to 98 feet. Between 38<sup>th</sup> Avenue and Washington Way, right-of-way width varies from 80 to 115 feet, and runs at a consistent 80 feet between Washington Way and Oregon Way. Between Oregon Way and Tennant Way at 3<sup>rd</sup> Avenue, along the portion of Industrial Way with frequent driveways and intersecting streets, right-of-way averages between 90 and 100 feet. The remainder of the corridor along Tennant Way from 3<sup>rd</sup>

Avenue to I-5 averages approximately 150 feet in width.

## **PHYSICAL CONSTRAINTS**

The corridor has a number of physical constraints in addition to potential right-of-way limitations. From approximately SRMP 3.00 near 38th Avenue to SRMP 5.95 slightly west of Oregon Way there is a large drainage ditch along the north side of the roadway. A rail line runs along this segment south of the roadway through this section of the corridor. Both are about 50 feet from the edge of pavement. Along the Industrial Way portion of the route (SRMP 6.10 to 7.10) there are many buildings fronting the highway, but they are generally set back 40 feet or more from the edge of pavement. This section also has the greatest concentration of driveways in the corridor as was discussed under access management.

## **HORIZONTAL AND VERTICAL ALIGNMENTS**

As characterized in the *WSDOT Roadside Classification Log*, the entire corridor has an urban character with level terrain. Detailed alignment data is available for the highway between SRMP 7.62 and 10.33 in the most current version of the *WSDOT Horizontal and Vertical Alignment Report* from the TRIPS highway database. Due to the recent change in the roads designated as SR-432 (based on the *Road Jurisdictional Study*), horizontal and vertical alignment data is not yet available for the section between the Willow Grove Road/SR-4 intersection at SRMP 0.00, where SR-432 begins, and the 3rd Avenue/Tennant Way interchange at SRMP 7.62.

Based on field observations between SRMP 0.00 at Ocean Beach Highway (SR-4) and SRMP 7.62, the vertical alignment is generally level, with some rolling terrain toward the western end of the corridor. From SR-4 to Memorial Park Drive along Willow Grove Connection Road there are frequent horizontal curves. This portion of the roadway has experienced some problems with pavement settlement and parts of the roadway surface are bumpy, particularly for trucks. Continuing east from Memorial Park Drive (SRMP 2.78), the horizontal alignment is straight until reaching the Industrial Way/California Way/3rd Avenue intersection (SRMP 7.10), where it angles toward the north.

From SRMP 7.62 to 10.33, where alignment data is available, vertical alignments range from flat to five percent, with vertical curves ranging from 100 to 800 feet. For horizontal alignment, the curve radii range from 1,433 to 11,460 feet, with the length of horizontal curves ranging from 112 to 1,490 feet. Design speeds in this segment are based on stopping sight distance generally exceed 80 mph, except at SRMP 7.67, where the stopping sight distance corresponds to a design speed of 45 mph, and from SRMP 9.60 to 10.11, where the stopping sight distances correspond to design speeds ranging from 45 to 70 mph. The posted speed is 55 mph for the entire section.

A composite grade analysis was conducted by the WSDOT Southwest Region for both directions of the segment from SRMP 7.67 to 10.33. The calculated ending speeds generally were 55 mph except for two segments in each direction. In the eastbound (increasing) direction, the ending speed was less than 55 mph from SRMP 9.54 to 9.99, and SRMP 10.31 to 10.33. In the westbound (decreasing) direction, calculated ending

speeds were less than 55 mph from SRMP 9.82 to 9.38 and SRMP 7.87 to 7.67.

## **CORRIDOR BRIDGES**

Five bridge structures exist on SR-432. Bridges 432/8 N and S (3rd Avenue) are 0.06 miles in length (SRMP 7.64 to 7.70), bridges 432/10 N and S (Cowlitz River) are 0.32 miles in length (SRMP 9.58 to 9.90), and bridges 432/12 N and S (I-5) are 0.04 miles in length (SRMP 10.29-10.33). The bridges all have four lanes, no shoulder or sidewalk and paved widths of 48 feet and a 10-14 foot paved median. In addition there is one culvert over Solo Slough. Table 5 presents a summary description of each bridge.

## **INTERSECTION GEOMETRICS AND TRAFFIC CONTROL**

This section summarizes intersection and driveway frequency, general configuration and traffic control in the SR-432 corridor. The material was taken from the *WSDOT State Highway Log* and *Project Geometric Detail*, which provides more detailed information.

There are eleven signalized intersections in the corridor between SR-4 at SRMP 0.00 and the intersection of the Tennant Way eastbound off-ramp and 3rd Avenue, immediately north of the Industrial Way overcrossing at SRMP 7.62 (the Tennant Way eastbound off-ramp/Industrial Way intersection is part of SR-411 and therefore has no SR-432 milepost number). Stop sign control is used at the remaining unsignalized intersections to control side street traffic.

**Table 5**  
**Status of SR-432 Corridor Bridges**

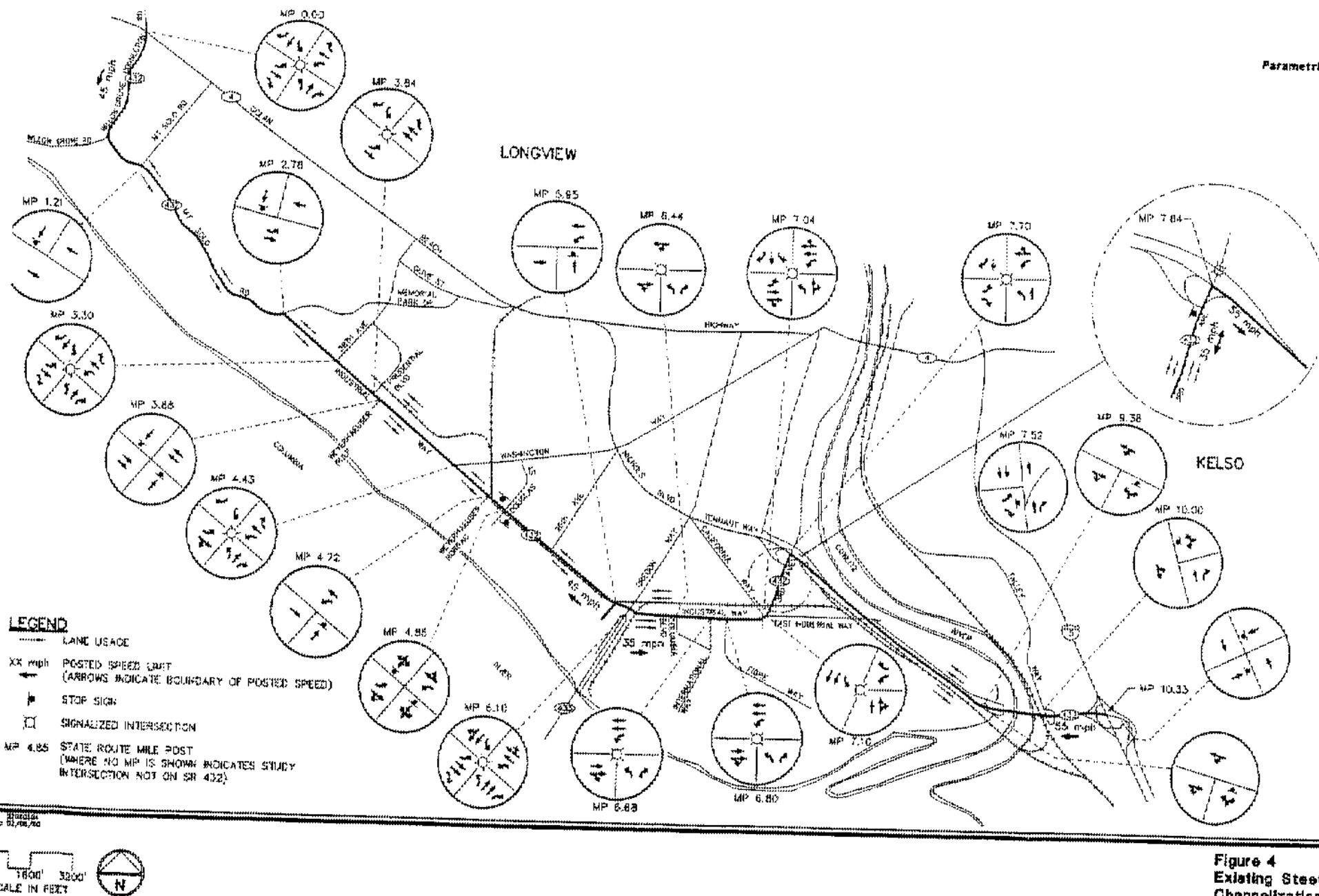
Bridge No.	SRMP	Length	Location	Condition
432/8N	7.62	0.06	3 <sup>rd</sup> Avenue	Deck is worn to aggregate in wheel lines with some areas of light scale. Many exposed vertical rebars on inside face of North bridge railing. West approach has settled approximately ¾ inches. No flaws noted in concrete columns.
432/8S	7.62	0.06	3 <sup>rd</sup> Avenue	Light wear on the deck in the wheel lines. Transverse leaching cracks in the overhang, some are rusting. One column has exposed horizontal rebar on the west side. West approach has settled up to ¼ inch.
432/10N	9.58	0.32	Cowlitz River	Concrete deck has numbers transverse cracks. Worn to aggregate and starting to rut in places. No cracks, missing rivets or crack in the welds of steel members. ½ inch settlement on east approach.
432/10S	9.58	0.32	Cowlitz River	Bridge deck worn to aggregate in wheel lines. Scattered areas of heavy scale and scattered spots of exposed rebar up to 3 feet long. Transverse leaching cracks in the overhangs throughout. Numerous shear and bending cracks in box girder webs. West portal has 3 highload hits, 2 are torn with the worst bent out of plane approximately 3 inches. Leaching cracks at the base of split columns. Mastic deck joints over the floor beams in the truss span has failed with many sections missing, water and dirt pour through the joints and onto the floor beams. Recommended repair of missing/damaged mastic deck joints.
432/12	10.29 to 10.33	0.04	I-5	Some cracking of surface, columns and pier walls.

Source: Excerpts from WSDOT Bridge Inspection Report, received 3/28/00.

Left turn lanes on SR-432 are provided at each signalized intersection except the Columbia Boulevard intersection, which has no turn lanes on SR-432. From west to east, right turn lanes on SR-432 are located at the intersections with SR-4, 38th Avenue/

Reynolds Aluminum Company and SR-433/Oregon Way. Figure 4 illustrates the location and intersection geometrics of signalized intersections along SR-432 and many of the major unsignalized intersections.





Several of the intersections identified in Figure 4 are intermodal access points to the industrial area along the north shore of the Columbia River in Longview. Weyerhaeuser Paper Company and the Norpac Company are among the primary industrial users for which SR-432 is a critical intermodal link between interstate ground freight traffic and deep-draft cargo ships from the Columbia River. Heavy rail is the third intermodal component, with several local access and switching tracks operated by the Longview Switching Company paralleling and crossing SR-432 at several points west of the Longview Wye (adjacent to the I-5/SR-432 interchange).

On the east end of the corridor, Talley Way serves as access to the Kelso industrial area north of SR-432. Access to the industrial property south of SR-432 has not been developed due to constraints at the Talley Way interchange and weaving problems between that interchange and I-5.

## **TERRAIN AND ROADSIDE CHARACTER**

West of its intersection with SR-4 to Mount Solo Road, the roadside character of the SR-432 corridor is largely rural. Terrain is flat with drainage facilities paralleling the highway between approximately SR-4 and Oregon Way. Roadside character of the corridor is largely urban from the intersection with Mt. Solo Road to the I-5 interchange.

## **PEDESTRIAN AND BICYCLE FACILITIES**

There are presently no sidewalks or bicycle facilities provided on any portion of the SR-432 corridor. Both sides of the highway from

SRMP 0.0 to SRMP 6.09 have paved shoulders ranging from 3 to 10 feet wide. From SR-4 (SRMP 0.00) to Memorial Park Drive (SRMP 2.78) the shoulder width is six feet on each side. Between Memorial Park Drive and Washington Way (SRMP 4.43), shoulder width varies between 3 and 9 feet. According to the WSDOT *Design Manual*, an 8-foot shoulder width is identified as desirable for an urban minor arterial roadway classification such as this portion of SR-432. East of Washington Way, the corridor is designated as an urban principal arterial for which a minimum 8-foot shoulder width is identified as desirable. Between Washington Way and Oregon Way (at SRMP 6.10), shoulder width varies between 3 and 10 feet. East of Oregon Way to the start of the limited access section of the corridor at Tennant Way (SRMP 7.61), the street has curbed edges with no designated bicycle facilities or sidewalks.

Except for the Tennant Way Bridge over the Cowlitz River (SRMP 9.58 to 9.89) and the bridge over I-5 (SRMP 10.29 to 10.33), which have no shoulders or sidewalks, the limited access section of the corridor (SRMP 7.62 to 10.33) has 8 to 10 foot paved shoulders.

Truck traffic and total vehicle traffic volumes along SR-432 between SR-4 and Memorial Park Drive are relatively low and the existing 6-foot shoulders provide refuge for bicycle and pedestrian traffic, although conditions are less than ideal. East of Memorial Park Drive, conditions are generally not favorable to bicycling or walking as the corridor carries a high percentage of truck traffic, there are no pedestrian refuges and (generally between Oregon Way and 3<sup>rd</sup> Avenue), there are frequent intersections and curb cuts that interfere with the safe movement of pedestrians and bicyclists.

## **ROUTE CONTINUITY**

SR-432 intersects with SR-4 on the western end of the study area. SR-4 provides a connection between the Longview/Kelso area and a variety of destinations in the southwestern tip of Washington State including western Cowlitz County, and Wahkiakum and Pacific Counties. On the eastern end, SR-432 ends where it crosses over I-5. On the west side of I-5, southbound connections are provided between SR-432 and I-5. East of the Interstate, SR-432 divides, providing connections to and from I-5 northbound and Old Highway 99, which parallels I-5 immediately east of the freeway. SR-432 also provides access to the State of Oregon and the City of Rainier via SR-433 and the Lewis and Clark Bridge over the Columbia River to U.S. 30.

## **EXISTING RAIL TRANSPORTATION SYSTEM IN SR-432 CORRIDOR**

Rail/truck conflicts have been identified as a significant traffic circulation problem in the SR-432 corridor. As such, it is important to document in this Route Development Plan the nature of rail facilities in the corridor, potential rail system improvements, and existing and future rail operations as they might impact traffic operations along SR-432. This section identifies the existing rail facilities and operational practices in the corridor, identifies proposed rail system improvements including the Port of Longview's Alternate Rail Corridor, and lays a foundation for understanding the nature of rail-related impacts on existing and future traffic circulation.

## **Existing Rail Facilities and Providers**

The Burlington Northern Santa Fe Railroad (BNSF) owns and operates a double track mainline running north-south along the east bank of the Cowlitz River through Kelso. Union Pacific Railroad (UP) has trackage rights on this mainline. These two railroads set out and pick up unit trains at Longview Junction destined for or departing the local Longview industrial rail network. Passenger rail service is also provided along this corridor by AMTRAK. Approximately 70 to 80 freight trains and 8 to 10 passenger trains travel along this double track mainline each day.

### **BNSF Mainline Track**

The double track mainline crosses SR-432 near I-5 at a grade-separated crossing. There are no other crossings of the double track mainline and SR-432. The mainline tracks do not have any direct impact on SR-432 traffic. The BNSF mainline along I-5 is being evaluated for potential high speed rail service between Vancouver, B.C. and Eugene, Oregon, including stops in Seattle, Kelso, Vancouver, Portland and other points. North/south high speed rail would have only peripheral effects in the SR-432 corridor, and is not addressed further in this document.

### **Longview Junction Yard**

Inbound and outbound rail cars in the Longview area are set-out and picked-up by BNSF and UP at the yard at Longview Junction (see Figure 5). Service between this yard and final industry destination in the Longview area is provided by Longview Switching Company. This yard consists of 12 tracks and has a total track capacity of 687 cars, not including the controlled siding, which holds 105 cars. Currently, at least seven BNSF and six UP unit trains either

arrive at or depart Longview Junction daily. Existing operations, which include set-out and pick-up activity, unit train activity, and turning of road power (e.g., moving the engine from one end of a train to the other) represents a full utilization of the yard's capacity.

### **Longview Switching Company Yard**

Longview Switching Company (LSC) is a terminal switching company that is jointly owned and operated by BNSF and UP. Using its yard adjacent to SR-432 to perform further switching and classifying of rail cars, LSC moves strings of cars between the Longview Junction yard and industries served by rail. This yard consists of 15 tracks, is approximately 7,000 feet in length and has a capacity of 760 cars.

When an inbound unit train arrives at Longview Junction, LSC uses either one or two GP-38 (2,000 hp) locomotives to pull strings of cars from Longview Junction to their destination in the Longview area. Where possible, trains are pulled intact in unit trains (up to 108 cars) to their destination. Otherwise, trains are broken into smaller strings of cars at the LSC yard. This yard generally operates at full capacity (i.e., where all storage tracks are occupied with cars waiting to be handled). The trackway connecting the LSC yard with the Longview Junction and the BNSF mainline crosses Dike Road immediately south of SR-432 and west of the Cowlitz River (see Figure 5 - crossing #1). Dike Road currently serves as access to the Cowlitz County landfill and the frequent blockage of this crossing by unit trains disrupts this access.

### **Local Industrial Rail Traffic**

LSC sets-out and picks-up cars for most of the rail-served industries in the Longview

area. The Columbia and Cowlitz Railroad which is owned and operated by Weyerhaeuser, also operates in the area. A summary of industrial rail traffic and its impacts on the SR-432 corridor at a variety of at-grade roadway crossings is presented below. Table 6 summarizes key features of each at-grade crossing location including function or destination of the track, level of existing rail traffic, and proposed future improvements to the track, if any. These proposed improvements are covered in greater detail in the next part of this chapter.

In Table 6, the existing level of rail activity is described as “high”, “moderate”, and “low”. These terms are relative in relation to each other with low being very infrequent usage (typically one, short train per week or less), moderate being 4 or 5 trains per week (typically including 40 to 50 cars each), and high being a greater activity level than moderate. Typically, high rail traffic is experienced only along the trackway leading to/from the Port of Longview.

### **Port Lead Track**

The Port of Longview is currently served by its lead track that originates at the north end of the LSC yard, takes an east-west alignment through a heavy industrial traffic district in south Longview, then curves to the south to an alignment parallel to Oregon Way, heading into the Port of Longview. The Port lead track between the LSC yard and the Port crosses SR-432 at two at-grade crossings; one on 3rd Avenue north of Industrial Way (crossing #3 in Table 6) and the other on Industrial Way east of Oregon Way (crossing #5). The track also makes a third roadway crossing in the corridor on California Way immediately north of SR-432 and west of the 3rd Avenue crossing (crossing #4). Figure 5 illustrates the location of these crossings.

**Table 6**  
**Summary of Existing At-Grade Rail Crossings in SR-432 Corridor**

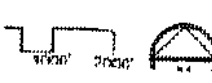
<b>Grade Crossing</b>	<b>Location</b>	<b>Railroad Track</b>	<b>Existing Rail Traffic</b>	<b>Future Rail Traffic After Proposed Rail Improvements</b>
1	Dike Road	Longview Switching Co. lead	High	Does not benefit from the alternate rail corridor improvement; significant rail traffic growth is anticipated.
2	Tennant Way (SR-432)	Lead track serving Cytec	Low	Low – no improvements proposed.
3	3rd Avenue (SR-432)	Port lead	Moderate to High	Reduced by 51% of Port rail traffic by alternate rail corridor; reduced further by Reynolds connection; elimination from SR-432 corridor if SR-432 is rerouted.
4	California Way	Port lead	Moderate to High	Reduced by 51% of Port rail traffic by alternate rail corridor; reduced further by Reynolds connection.
5	Industrial Way	Port lead	Moderate to High	Reduced by 51% of Port rail traffic by alternate rail corridor; reduced further by Reynolds connection.
6	Oregon Way	Reynolds lead	Moderate	No change unless Oregon Way is raised over Industrial Way and Reynolds rail connection.
7	Industrial Way	Reynolds lead	Moderate	Eliminated with proposed Reynolds rail connection to alternative rail corridor.
8	Industrial Way	Columbia & Cowlitz lead serving Weyerhaeuser	Moderate to High - 4 trips per weekday; up to 640 cars per week; maximum 40 car trains.	Moderate - no improvements proposed.

Source: BRW, Inc., 1997.

Note: Low = less than 5 trains/week, few cars/train  
Moderate = Average 1 train/day, 10-15 cars/train  
Moderate to High = 1-4 trains/day, 15-100 cars/train  
High = 4+ trains/day, all lengths

The rail traffic to and from the Port represents a substantial rail impact on the SR-432 corridor. The Port of Longview currently handles approximately 16,200 inbound and 16,200 outbound rail cars annually. Of these, 5,800 inbound and outbound cars are handled in unit trains of 100 cars each, and the rest in smaller strings of 50 to 70 cars. The smaller strings of cars block two major crossings of

the SR-432 corridor frequently (crossing #3 on 3<sup>d</sup> Avenue and crossing #5 on Industrial Way east of Oregon Way – see Figure 5), but vehicle queues dissipate fairly rapidly. On an average, there are 3 to 5 of these smaller trains each week, although frequency and train length could vary considerably in response to market demand for transportation services. A unit train passes through the



**Figure 5**  
**Existing Rail Network**  
SR 432 ROUTE  
DEVELOPMENT PLAN

corridor on an average of twice a week (once inbound and once outbound), blocking the two major SR-432 rail crossings simultaneously for up to 10 minutes. This creates congestion and significantly affects emergency vehicle access to the industrial area. The impacts of unit trains are further evaluated later in this chapter under the discussion of future rail operations.

### Weyerhaeuser Mill - Columbia and Cowlitz Railroad

The Columbia and Cowlitz Railroad sets-out and picks-up cars at Weyerhaeuser and several other smaller industries in the area, using its trackage which branches off the Reynolds lead track to the north, crosses SR-432 at-grade (crossing #8 in Table 6), and then runs parallel to the north of Ocean Beach Highway connecting to the BNSF mainline at Rocky Point north of Longview. This track crosses several roads at-grade, including Washington Way and Ocean Beach Highway (SR-4). The crossing of SR-432 (Industrial Way) is located west of the more congested portion of the SR-432/Industrial Way corridor. However, the impact of this crossing on SR-432 is significant and will become more significant in the future as Prudential Steel activity grows and if other rail-dependent tenants occupy the Mint Farm development.

The Columbia and Cowlitz Railroad currently makes two return trips between Weyerhaeuser and Rocky Point per weekday, crossing SR-432 just west of Douglas Street on each trip. One return trip occurs in the morning (between 8:00 AM and 10:00 AM) hauling up to approximately 20 cars. The other return trip occurs at night (between 8:00 PM and 10:00 PM) hauling up to approximately 40 cars. One return trip of up to 20 cars is also hauled on the weekend, either Saturday or Sunday. The

volume of traffic from the Weyerhaeuser mill currently makes up the majority of rail traffic on this Columbia and Cowlitz lead track. The Prudential Steel mill on the Mint Farm property has added to the level of rail traffic at Crossing #8. Rail access to the steel mill from the Columbia and Cowlitz Railroad line will be via the extension of an existing spur track to Interlox. This spur track will cross the main entrance road from SR-432 to the steel mill, causing periodic interruptions to site access and egress. Alternative site access will be available via 38th Avenue.

### Reynolds Aluminum

LSC provides rail service to and from Reynolds Aluminum via the Reynolds lead track and the Port lead to the LSC yard. Reynolds rail traffic crosses two major roads, Industrial Way (crossing #7 - part of the SR-432 corridor) and Oregon Way (crossing #6 - which leads to the Lewis and Clark bridge.)

### Cytec, Inc.

The industry lead track providing service to Cytec originates in the LSC yard, crosses SR-432 mid-way between the Cowlitz River and the 3rd Avenue interchange (crossing #2), runs parallel and adjacent to the north side of SR-432 to 3rd Avenue where it curves to the north, parallels 3rd Avenue (SR-411) on the east, and finally dead-ends just north of the switch to the Cytec spur. Cytec is the only industry served by this track. Switching movements between Cytec and the LSC yard are performed by LSC. Each movement results in an at-grade crossing of SR-432. The crossing location is protected by flashing cantilever signals and crossing gates. Because of the low rail volume on this track, it is currently not a pressing problem for vehicles on SR-432, however, at-grade train activity does create a potential safety

problems and may result in traffic conflicts as corridor traffic levels grow.

### Longview Fibre Lead Track

This track originates at the south end of the LSC yard and provides rail service to Longview Fibre, but has no impacts on SR-432 following condemnation of the wood and steel bridge over the Log Pond Slough, which eliminated rail connections to the Port of Longview's lead track.

### **Grade Crossings**

At-grade crossings are critical locations along highway corridors due to the interaction of railroad and vehicular traffic, which creates the potential for train-vehicle conflicts and can cause significant delays, especially during the morning and afternoon peak traffic periods. The SR-432 corridor currently has several at-grade rail crossings which are listed from east to west in Table 4. All the crossings are protected by automatic flashing signals and gates. The far right column of Table 4 indicates whether future improvements will affect the grade crossing. The future improvements, primarily the proposed alternative rail corridor, are discussed further in later in this chapter.

## **FUTURE RAIL OPERATIONS IN SR-432 CORRIDOR**

Rail facilities in the corridor have been the subject of recent study due to the consideration of the Port of Longview for a new major bulk terminal. The findings of this study were reviewed for the Route Development Plan (*Port of Longview Traffic Impact Assessment* (BRW, Inc., 1997). According to the study, development of the bulk terminal will significantly increase unit

train activity between the BNSF mainline and the Port of Longview industrial area. The terminal is anticipated to receive between one and four 110-car unit trains per day. Annual traffic in excess of 450 unit trains is expected. This potential new rail traffic represents a significant increase in railroad activity in the Longview area. In studies for the bulk terminal, it was estimated that two at-grade rail crossings of SR-432 and a third on California Way would be blocked for up to an additional 10 minutes twice a day for each train (one trip each way). If the planned maximum of up to four unit trains per day were achieved, then a daily total of eight 10-minute road blockages would occur. In the *Alternate Rail Corridor Study* (BRW, Inc., 1996), it was determined that this new train activity could require an additional 45 minutes during the PM peak period for congested traffic to clear after each train preemption. Because all three crossings would be blocked at the same time, resulting in major traffic congestion and severely affecting emergency vehicle accessibility, an alternate corridor for these Port-bound trains was developed. This corridor will be discussed in the following section.

From information available at this time, all significant increases in railroad traffic for the foreseeable future will stem from three sources: one, directly from shipments to/from the export grain terminal; two, as a result of spin-off effects from the alternate rail corridor which will also provide some benefits to existing rail users; and three, from the Prudential Steel mill at the Mint Farm and accessed via an extension of the existing rail spur serving Interlox. With development of the alternate rail corridor, some decrease in existing levels of rail traffic is expected in the SR-432 corridor. However, this decrease may be at least partially offset by increased rail activity associated with the steel mill. As discussed elsewhere in this report, the



vehicular traffic implications of increased rail activity could be significant in several locations.

### ***Rail System Improvements Currently Under Consideration or Development***

#### ***Port of Longview - Alternate Rail Corridor***

As discussed above, this proposed project was spurred by plans to build and operate a new major bulk terminal at the Port of Longview. Planning for this project, including preliminary engineering and environmental permitting, is complete. Project construction is expected to begin in 2000.

The alternate rail corridor would originate at the south end of the Longview Switching Company (LSC) yard, off the start of the Fibre lead track. The proposed double track corridor would then proceed west, skirting the north edge of the Cowlitz County Wastewater Treatment Center, through Pacific Fibre Products property, and across Fibre Way, towards the Port of Longview. This trackage alignment is illustrated in Figure 6. The rail corridor would have a major impact to Fibre Way, so planning efforts incorporated a grade separation where Fibre Way is raised over the railroad tracks.

The alternate rail corridor concept has been endorsed and will be constructed. When in place, this corridor will eliminate the heavy impacts to SR-432 resulting from rail traffic to/from the bulk terminal. As an additional benefit, the Port of Longview estimates that 51 percent of their current rail traffic now using the Port lead track could be redirected onto the alternate rail corridor (anticipated to be primarily the existing unit train activity). This will represent a substantial decrease in impacts to vehicular traffic along the SR-432 corridor, reducing travel time delay due to rail operations and lowering the risk of

vehicle/rail conflicts. It can be viewed as a key component to traffic management for this corridor. Railroad crossing locations which will benefit from this rerouting are depicted in Figure 6 and include: crossing #3 on 3rd Avenue north of Industrial Way (on SR-432), crossing #4 on California Way north of Industrial Way, and crossing #5 on Industrial Way east of Oregon Way (also on SR-432). Reduced rail traffic over the grade crossing at Industrial Way (#5) will help to ease congestion at the Oregon Way/Industrial Way intersection just to the west where some of the highest traffic volumes in the corridor presently occur.

Other benefits of the alternative rail corridor include: not blocking emergency vehicle response access routes into and out of the industrial area; and shorter train travel times between the BNSF mainline and the Port (rail operational benefit).

It should be noted that the existing at-grade crossing of Dike Road will not benefit from development of the alternate rail corridor and will be significantly impacted by the addition of rail traffic associated with the export grain terminal.

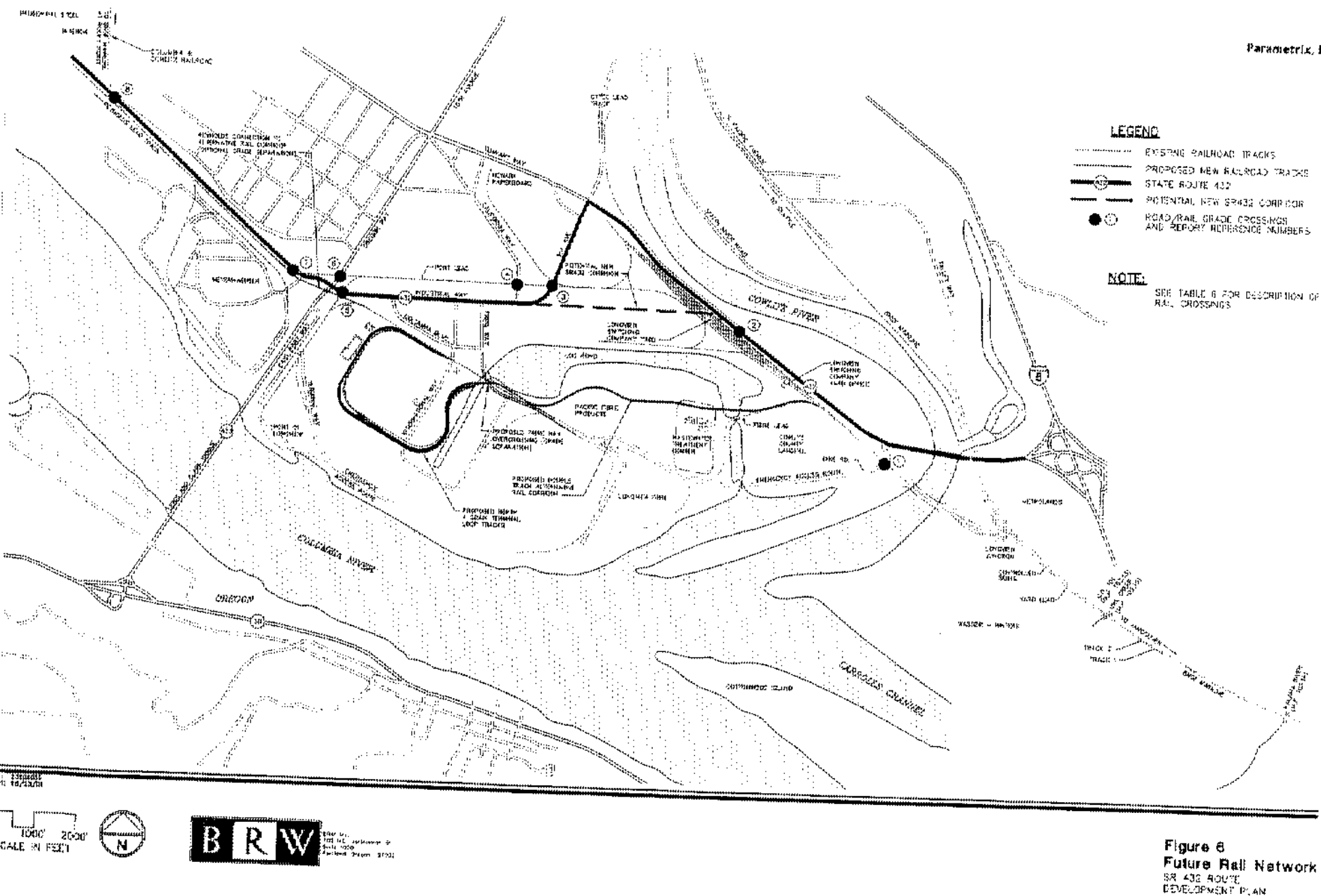
#### ***Reynolds Connection to Alternate Rail Corridor***

One road/rail at-grade crossing on SR-432 would be eliminated by constructing a connection between the Reynolds lead track and the west end of the alternate rail corridor (see Figure 6). The Reynolds lead at-grade crossing of Industrial Way would be eliminated by this connection. The at-grade crossing of Oregon Way would still exist. However, from a rail operations standpoint, this new connection would make it feasible to grade separate the Oregon Way/Industrial Way intersection. Oregon Way could be raised up over Industrial Way and the new rail

connection that would run parallel to and south of Industrial Way.

The proposed Reynolds connection would also reduce train traffic in the SR-432 corridor

by providing a rail route between Reynolds Aluminum and the LSC yard via the alternate rail corridor that would not cross SR-432 at any location.



**Figure 8**  
**Future Rail Network**  
SR 402 ROUTE  
DEVELOPMENT PLAN

## CHAPTER 4

### PRESENT AND PROJECTED OPERATING CONDITIONS

This chapter describes current traffic operations, based on existing information provided by WSDOT and other local agencies. The information analyzed for this section included previous studies and recommendations, existing and historical traffic volumes including seasonal traffic variations and level of heavy vehicles in the traffic stream, existing roadway and intersections traffic operating conditions, accident data, and a summary of public input on corridor deficiencies.

#### **CORRIDOR TRAVEL PATTERNS**

As noted in Chapter 1, SR-432 serves a multiplicity of transportation functions and trip types. The road is a major industrial travel corridor connecting the Port of Longview and adjacent industrial property to Interstate 5. It provides a link to connect Columbia River communities in both Oregon and Washington with I-5 (via SR-433 and the Lewis and Clark bridge to/from Oregon (U.S. 30), via SR-4 in Washington). The corridor also serves to provide access to the light and heavy industrial and commercial property which abuts it.

Recently, there have been several studies conducted by the Cowlitz-Wahkiakum COG that addressed travel patterns within specific portions of the Longview/Kelso/Rainier urban area. Only one of these studies directly addressed SR-432, but the others provide an indirect assessment of travel patterns in the corridor. These studies include:

- A 1994 report entitled *Cowlitz River Crossing Phase I: Origin-Destination*

*Methodology and Findings* which was a part of the study undertaken to evaluate options for improved crossings of the Cowlitz River.

- The 1990 *Lewis and Clark Bridge Origin-Destination Study*.
- The 1997 *SR-432 Corridor Truck Survey*.

The first two surveys were conducted using a roadside interview technique. The third was conducted through use of a mail or deliver back questionnaire and was conducted in cooperation with local businesses.

#### **Cowlitz River Crossing Survey**

The Cowlitz River Crossing study distributed a mail-back survey questionnaire to users of all three existing Cowlitz River bridges to assess current travel patterns of drivers crossing this river. This survey indicated that nearly 80 percent of the traffic at the Tennant Way bridge (SR-432) over the Cowlitz River were either traveling to or from home, work or shopping. Over half the users of the Tennant Way Bridge began or ended their trip outside the study area, which included the Kelso/Longview urban area and the entire SR-432 corridor.

#### **Lewis and Clark Bridge O-D Survey**

The Lewis and Clark Bridge survey indicated that over 90 percent of the traffic stream was passenger vehicles, with truck traffic accounting for about six percent of bridge traffic. Primary trip purposes were similar for origins and destinations, and were also similar to the Cowlitz River crossing survey: about

40 percent to or from home, with 29 percent and 18 percent to/from work, respectively and the remainder for other home-based trip purposes. Trips to or from shopping or recreation each accounted for about 10 percent of the total for a total of 20 percent of all trips. Although the survey was conducted in 1990, before the Trojan nuclear plant was closed, general growth in the area between 1990 and 1995 resulted in no significant change in the daily traffic volume over the bridge despite the reduction in work trips to and from the power plant. Major origin/destination connections were between Central Longview and Kelso and the US 30 corridor in Oregon (work trips), Longview and Rainier, Oregon (shopping and work trips), and between Portland or Vancouver and the Pacific Coast. Over 10 percent of respondents used the bridge as a connection to and from Portland metropolitan area.

### ***SR-432 Corridor Truck Survey***

The 1997, a survey of truck travel patterns in the SR-432 corridor was conducted by the COG. This survey was performed by local business and property owners who were represented on a corridor stakeholders planning group. Although the survey questionnaire was not designed to be statistically representative or even randomly applied, the results are representative of the travel patterns by several major trucking operations within the corridor. More complete documentation of this survey is included in Appendix B.

Two hundred (200) questionnaires were distributed to participating businesses. One hundred and twenty (120) of these questionnaires were returned for a response rate of 60 percent. Survey responses indicate that there are two primary types of truck activity within the corridor; interstate-based long-haul trucks with local destinations; and

local service truck trips. The long-haul trucks are typically large, multi-axle or multi-unit vehicles. They may travel to/from destinations as far away as Pennsylvania and Texas. Local trips are typically made by smaller commercial vehicles and large log/chip trucks that use SR-432 to make repeated and linked trips back and forth around the Longview/Kelso/Rainier urban area.

Local service commercial vehicle use of the SR-432 corridor is complex and closely related to localized land use patterns and the industrial-based economy. The large industries and Port facilities located in the SR-432 corridor attract and support a multitude of smaller firms that provide locally-necessary support services and commodities. Many of these smaller businesses are also located along SR-432, but others are scattered throughout the urbanized area.

The survey identified two key issues or goals to be addressed in the SR-432 Route Development Plan.

- Improve access for large trucks between the Industrial Way portion of SR-432 and I-5.
- Facilitate more efficient connections for commercial vehicles serving businesses within the industrial area and making trips between these businesses.

These two goals are fundamentally in conflict with each other, both in terms of highway function and design. On one hand, there is a need to facilitate traffic movement through the corridor in the quickest and most efficient fashion possible. This would argue that there should be few interruptions for through-moving traffic, such as signals and frequent side streets or driveways. On the other hand,

there is a need to provide traffic access to local businesses along the corridor using the available driveways and local streets. The conflict comes when through-moving vehicles are slowed or delayed by vehicles entering and leaving driveways. Along portions of SR-432 (e.g. between Oregon Way and California Way), frequent driveway access to adjacent properties inhibits through traffic movement by increasing localized congestion and requiring the through vehicles to slow down for turning vehicles.

In addition to identifying truck travel patterns within the SR-432 corridor, the truck survey also provided information about truck use and a meaningful representation of the concerns of truck drivers about SR-432. Key conclusions are:

- 69 percent of the survey respondents use SR-432 on a daily basis.
- The most common types of trucks in the corridor are single tractor-trailers, log trucks, flatbed trailers, and commercial-use pickups.
- The most prevalent loads consist of logs, various freight and bulk commodities, and lumber.
- The most pressing concerns appear to include the following:
  - A perceived need for more and larger signs along the industrial corridor. Several users commented that existing signing is sometimes inadequate or confusing.
  - There is concern about congestion that results from too many driveways and too few turning lanes.

- There is a desire for separate travel lanes for commercial vehicles.
- The spacing of traffic signals was seen as inconvenient or disruptive to through traffic movement in certain locations.
- Roadway capacity was perceived as limited, particularly at the west end of the corridor near Reynolds Aluminum.
- Ruts in the existing roadway were noted.
- Comments were made about the perceived lack of traffic signal synchronization for truck traffic.

## **EXISTING DAILY AND PEAK HOUR TRAFFIC VOLUMES**

### ***Average Traffic Conditions***

Average annual daily traffic (AADT) volumes used for this study were obtained from traffic counts conducted by the WSDOT Southwest Region office in 1995 (these counts were adjusted upward to reflect 1997 conditions), WSDOT *Annual Traffic Reports*, and counts conducted in 1997 by WSDOT. Existing daily and PM peak hourly traffic volume data for roadway segments along SR-432 is summarized in Table 7. Figure 7 presents PM peak hour turning movement counts at key locations.

Current daily volumes range from a high of over 29,000 between 3rd Avenue and the Dike Road interchange (SRMP 8.17 to 9.68), to a low of 2,500 near Mt. Solo Road (SRMP 1.21). Volumes are highest in the eastern end of the corridor, between SR-433/Oregon Way (SRMP 6.10) and I-5 (SRMP 10.33).

**Table 7**  
**1997 Traffic Volumes Along SR-432**

Segment Description	Starting SRMP	Ending SRMP	Thru Lanes	Avg. Daily Volume (1)	PM Peak Hour Volumes		
					EB	WB	Total
SR-4 to 38th Avenue	0.00	3.33	2	2,500	130	140	270
38th Avenue to Washington Way	3.33	4.43	3 (2)	11,200	390	730	1,120
Washington Way to Weyerhaeuser	4.43	6.05	2	10,300	370	870	1,240
Weyerhaeuser Entrance to SR-433	6.05	6.10	2	9,100	310	510	820
SR-433 to EB SR-432 off-ramp to 3rd Avenue	6.10	7.47	4	17,400	740	660	1,400
EB SR-433 off-ramp to 3rd Ave U-xing	7.47	7.62	3 (3)	15,700	850	410	1,260
3rd Ave U-xing to Dike Road	8.17	9.68	4	29,500	1,390	1,280	2,670
Dike Road to I-5 SB off-ramp	9.68	10.10	4	28,600	1,450	1,140	2,590
I-5 SB off-ramp to I-5 SB on-ramp	10.10	10.26	4	25,400	1,310	990	2,300
I-5 SB on-ramp to I-5 bridge	10.26	10.33	4	16,500	805	685	1,490

Source: Unpublished count data from WSDOT, unless otherwise noted.

- (1) Seasonally adjusted average annual daily traffic volumes (AADT)
- (2) 2 westbound and 1 eastbound
- (3) 2 southbound and 1 northbound

### **Seasonal Traffic Variation**

Seasonal traffic volume information for SR-432 is not included in the State's *Annual Traffic Report*. However, data showing variations in seasonal daily traffic volumes in the area is available from a nearby permanent counter on SR-433, where peak summer volumes are about 27 percent higher than winter volumes. Seasonal fluctuations on SR-432 may fall within a similar range.

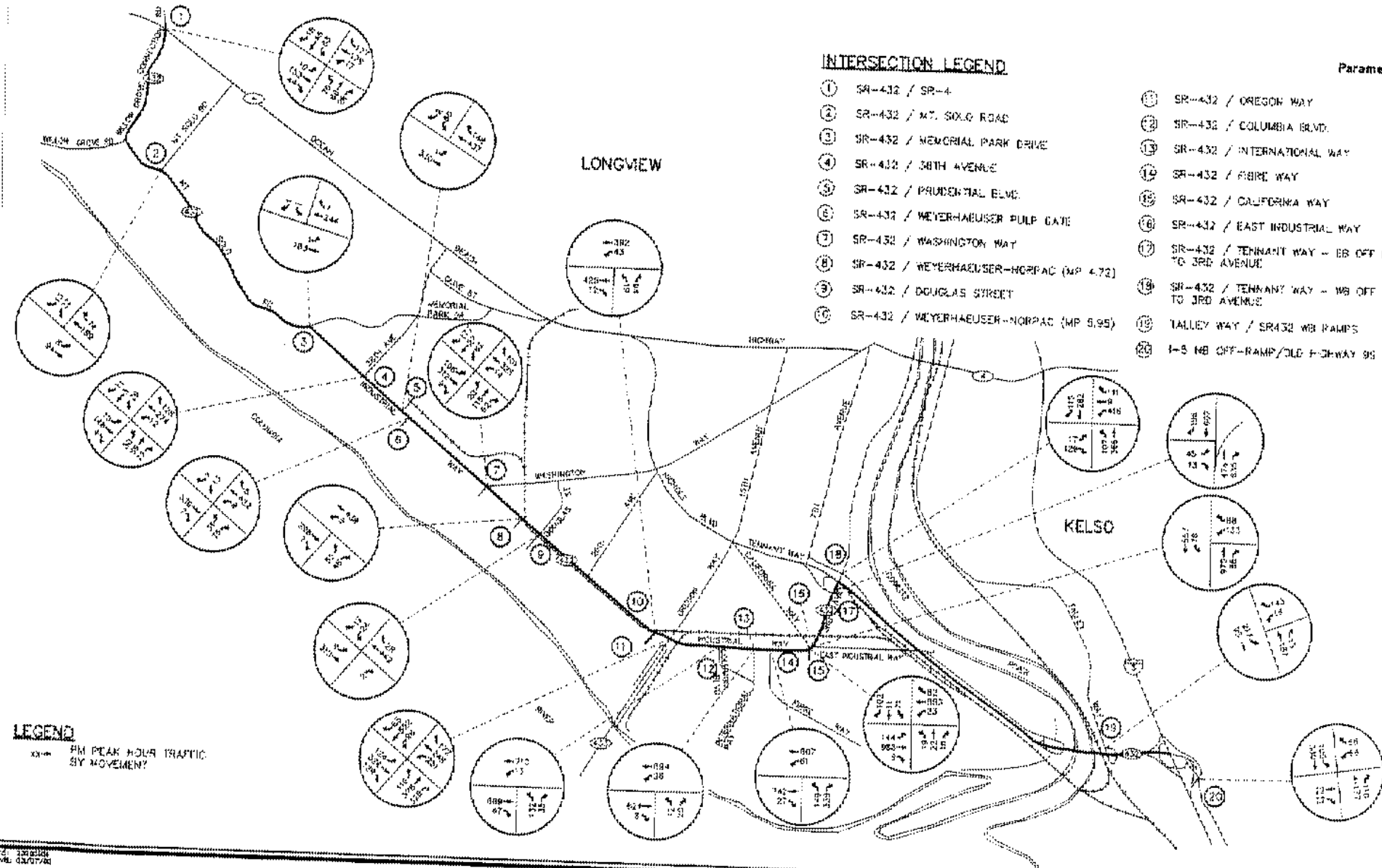
Table 8 shows the 1995 seasonal traffic volume variation on SR-433 by month and the relationship of average daily traffic in each month to an annualized average day. This relationship is used to establish conversion factors to derive average annual daily traffic from average weekday counts.

### **Mix of Vehicles in the Traffic Stream**

Information on existing truck traffic in the corridor was obtained from manual counts conducted by WSDOT and documented in the TRIPS System *Traffic Count History Report* from 1992 to 1995. Peak period truck traffic percentages range from about 10 percent on the western end of the corridor at Mt. Solo Road to nearly 40 percent during the morning peak period (6:00 AM to 10:00 AM) at International Way. The truck traffic percentage declines but still ranges from 15 to 30 percent between Oregon Way/SR-433 (SRMP 6.10) and East Industrial Way (SRMP 7.10). Table 9 summarizes the truck traffic percentages at various locations on SR-432.

# INTERSECTION LEGEND

- |  |  |
|--|--|
| ① SR-432 / SR-4                          | ⑪ SR-432 / OREGON WAY                              |
| ② SR-432 / MT. SOLO ROAD                 | ⑫ SR-432 / COLUMBIA BLVD.                          |
| ③ SR-432 / MEMORIAL PARK DRIVE           | ⑬ SR-432 / INTERNATIONAL WAY                       |
| ④ SR-432 / 38TH AVENUE                   | ⑭ SR-432 / FIBRE WAY                               |
| ⑤ SR-432 / PRUDENTIAL BLVD.              | ⑮ SR-432 / CALIFORNIA WAY                          |
| ⑥ SR-432 / WEYERHAEUSER PULP GATE        | ⑯ SR-432 / EAST INDUSTRIAL WAY                     |
| ⑦ SR-432 / WASHINGTON WAY                | ⑰ SR-432 / TENHANT WAY - EB OFF RAMP TO 3RD AVENUE |
| ⑧ SR-432 / WEYERHAEUSER-NORPAC (MP 4.72) | ⑱ SR-432 / TENHANT WAY - WB OFF RAMP TO 3RD AVENUE |
| ⑨ SR-432 / DOUGLAS STREET                | ⑲ TALLEY WAY / SR432 WB RAMP                       |
| ⑩ SR-432 / WEYERHAEUSER-NORPAC (MP 5.95) | ⑳ I-5 NB OFF-RAMP/OLD HIGHWAY 95                   |



**Figure 7**  
**Existing PM Peak Hour**  
**Traffic Volumes (1995-1996)**  
 SR 432 ROUTE  
 DEVELOPMENT PLAN



**Table 8**  
**Seasonal Traffic Volume Variations by Month on SR-433 South of SR-432**

<b>Month</b>	<b>Average Weekday Traffic Volume</b>	<b>Relationship to Average Annual Daily Traffic</b>
January	17,378	111%
February	18,452	105%
March	18,751	103%
April	19,421	100%
May	20,000	97%
June	20,733	93%
July	21,179	91%
August	22,109	87%
September	20,816	93%
October	19,413	100%
November	18,444	105%
December	17,361	111%
Average Annual Daily Traffic	19,328	100%

Source: 1995 Annual Traffic Report, WSDOT.

**Table 9**  
**Truck Traffic Percentages at Various Locations on SR-432**

<b>SRMP</b>	<b>Location</b>	<b>Truck Traffic Percentages of Daily Traffic</b>		
		<b>Single Unit</b>	<b>Truck-Trailer Combinations</b>	<b>Total</b>
0.02	SR-4 Junction	9	9	18
3.30	38th Ave./Reynolds Aluminum Co.	7	8	15
5.95	Weyerhaeuser Company	7	8	15
6.10	Oregon Way	10	18	28
6.68	International Way	10	21	31
7.04	California Way	10	20	30
7.62	3rd Avenue/Tennant Way	6	15	21
8.46	Longview City Limits	7	10	17
10.33	I-5 Interchange Bridge	8	8	16

Source: TRIPS System Traffic Count History Report, WSDOT, based on counts from 1992 to 1995.

## **EXISTING LEVELS OF SERVICE**

This section discusses existing levels of service in the SR-432 corridor. Included is a discussion of the concept of levels of service (LOS) and applicable LOS standards, an assessment of existing intersection, highway segment and interchange levels of service, and identification of existing deficiencies.

### **Level of Service Descriptions**

Levels of service offer a qualitative measurement of the overall traffic operating performance of a roadway segment or intersection. Level of service standards, used as a threshold for determining deficiencies in the transportation system, are expressed in grades ranging from A (free-flowing operational conditions) to F (operational breakdown). LOS B through E denote conditions of increasing platooning, decreasing speeds and increasing delay.

Levels of service shown in this document were calculated using methodologies in the *1997 Highway Capacity Manual (HCM)* for two-lane highway segments, multiple lane highway or freeway segments, signalized and unsignalized intersections. The variables and resulting performance measures for these four facility types are described briefly below.

Levels of service for two-lane highway segments are used to indicate the ability of drivers to use the opposing lane to pass slower vehicles. In general, as traffic volumes increase, adequate gaps in the opposing traffic stream are fewer and the ability to pass is reduced. Geometric factors affecting sight distance, such as roadway slope and curvature, also affect the ability to pass when desired. These factors are considered in the calculation of segment capacity. The level of service (LOS) is based

on a quantitative comparison between the level of traffic using or expected to use a given roadway and the calculated capacity of the roadway. This comparison between the traffic volume and the capacity for a given segment is termed the volume-to-capacity ratio, or v/c ratio. The v/c ratio is inversely correlated to the level of service: higher v/c ratios indicate slower travel speeds and greater delays, which translate to poorer levels of service.

Level of service for multi-lane facilities such as highways and freeways is based on the density of the traffic stream, which determines maneuverability and resulting vehicle speed. As with two-lane segments, higher volumes and slower travel speeds indicate poorer levels of service. Levels of service for freeway ramps are also related to the density of traffic and vehicle speed.

For signalized intersections, the LOS is related to the average control delay experienced by all vehicles before they are able to pass through the intersection. Control delay includes initial deceleration delay, queue move-up time, stopped delay and final acceleration delay and is dependent on two sets of variables: the capacity of the intersection as defined by the number of lanes, lane widths, etc.; and traffic signal timing. The *SR-432 RDP Phase 1 Report* identified intersection levels of service in terms of “stopped” delay consistent with the earlier 1994 *HCM*. This analysis has been updated for the final *RDP* report. Delay and level of service are calculated for each traffic movement or group of traffic movements at an intersection. The weighted average delay for all traffic movements determines the overall level of service at a signalized intersection. The relationship between LOS and delay is summarized in Table 10.

**Table 10**  
**Intersection Level of Service Criteria**

<b>Level of Service</b>	<b>Signalized Intersection Average Stopped Delay (seconds per vehicle)</b>	<b>Unsignalized Intersection Average Total Delay (seconds per vehicle)</b>
A	$\leq 10$	$\leq 10$
B	$> 10$ to $\leq 20$	$> 10$ to $\leq 15$
C	$> 20$ to $\leq 35$	$> 15$ to $\leq 25$
D	$> 35$ to $\leq 55$	$> 25$ to $\leq 35$
E	$> 55$ to $\leq 80$	$> 35$ to $\leq 50$
F	$> 80$	$> 50$

Source: Transportation Research Board, *1997 Highway Capacity Manual: Special Report 209, Third Edition*, December 1997

The level of service at an unsignalized intersection is also defined in terms of control delay and is identified for each minor movement. Average total delay is the controlling measure, defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle enters the intersection from the stop-controlled approach. The range of delay values for a given level of service at an unsignalized intersection are somewhat lower than those for a similar level of service at a signalized intersection. This difference in delay values is attributable to differing driver expectations: at a signalized intersection a higher degree of control provides greater predictability to the driver, and longer delays are more easily tolerated by most drivers.

### **State and Regional Level of Service Standards**

In 1992, the Cowlitz-Wahkiakum Council of Governments (CWCOG) as the lead agency for the Longview/Kelso/Rainier Metropolitan Planning Organization adopted level of service (LOS) standards applicable for streets and highways in the SR-432 corridor. As the entire road has an urban designation, LOS D

is the applicable standard. This standard is consistent with WSDOT *Highway System Plan* standards.

When a corridor's LOS falls below the applicable standard, improvements should be considered. When designing a corridor improvement, the WSDOT *Design Manual* specifies that the improvement meet LOS B for rural arterials and LOS C for urban arterials with infrequent signal spacing at the expected AADT (Annual Average Daily Traffic volumes) for the design year. The *Design Manual* level of service standards do not apply to facilities such as SR-432 that have signalized intersections at less than a two-mile spacing. However, they still provide a reasonable goal for use in developing potential improvements.

### **Calculation of Levels of Service**

Levels of service were calculated using the most recent available traffic counts both for highway segment and major intersections. These counts were obtained from a number of sources including a combination of intersection turn movement and highway segment counts conducted in 1997, and

highway segment counts taken in 1995 and factored to current levels that were used in the analysis contained in the *SR-432 RDP Phase I Report*. New count data was also obtained in 1998 and 1999 for several locations. Both roadway segment and intersection levels of service were determined using the procedures in the *1997 Highway Capacity Manual*. For intersections along Industrial Way between Oregon Way and 3<sup>rd</sup> Avenue, TRANSYT 7F software was used to evaluate traffic progression impacts on levels of service at signalized locations. For all other locations, single intersection or roadway segment highway capacity software was used.

### **Level of Service Deficiencies**

Based on the level of service standards adopted by the CWCOC and those incorporated into the *State Highway System Plan*, only one segment within the SR-432 is currently operating at an unacceptable level of service; the westbound weaving area between the ramp from southbound I-5 to westbound SR-432 and the westbound Talley Way off-ramp.

The weaving portion of this segment is currently operating at LOS E, while the through-moving portion is operating at LOS D. The eastbound roadway segment between the Talley Way on-ramp and the off-ramp to southbound I-5 is currently operating at LOS D for both the weaving and non-weaving portions. The weaving problem between the Talley Way and I-5 interchanges is expected to worsen with the addition of traffic attributable to both the Foster Farms processing plant and the highway commercial/industrial development proposed for the northwest quadrant of the I-5/SR-432 interchange. Table 11 summarizes existing levels of service for the interchange areas along the Tennant Way limited access portion of SR-432.

The roadway segments along SR-432 between SR-4 and Oregon Way are currently operating at LOS C or better. Freeway segments in the corridor between the 3<sup>rd</sup> Avenue/Tennant Way ramps and the Cowlitz River Bridge are currently operating at LOS B. Only the undercrossing of Tennant Way at 3<sup>rd</sup> Avenue is currently experiencing significant congestion, consistent with the poor levels of service experienced by specific traffic movements at the intersection of the Tennant Way westbound off-ramp to 3<sup>rd</sup> Avenue. Table 12 presents a summary of existing roadway and freeway levels of service within the SR-432 corridor.

Existing PM peak hour turn movements were analyzed at the corridor's eleven signalized intersections and nine of the major unsignalized intersections. The results of this analysis are summarized in Table 13. As indicated in Table 13, all of the intersections studied are currently operating at or above LOS D, meeting the *State Highway System Plan's* standards, as applicable, for urban and rural areas. Ten of the eleven signalized intersections function at LOS C or better during the PM peak hour with existing traffic. The intersection of the westbound ramp from Tennant Way at 3<sup>rd</sup> Avenue currently operates at LOS D during the PM peak hour.

Of the unsignalized intersections, only one movement currently operates at LOS D with 1997 traffic volumes, the eastbound left turn from the Tennant Way off-ramp at 3<sup>rd</sup> Avenue. Two individual traffic movements operate at LOS C; the southbound approach of the SR-432/Weyerhaeuser Pulp Gate entrance and the westbound left turn movement at the intersection of Old Highway 99 with the I-5 northbound off-ramp. The remaining unsignalized intersections operate at LOS A or B for all critical movements.

**Table 11**  
**1997 SR-432 Interchange Area Levels of Service**

Location	Movement	DHV (1)	Density	Speed	LOS	Comments
SR-432 at Talley Way	WB off	159	--	--	--	(2)
	WB on	232	18	51	B	
	EB off	202	17	51	B	
	EB on	111	--	--	--	(2)
Talley Way to I-5	Westbound on SR-432	422	--	39	E	Weaving
		997	--	46	D	Non-weaving
	Eastbound on SR-432	847	--	42	D	Weaving
		433	--	43	D	Non-weaving
I-5 at SR-432	I-5 NB off	938	13	59	B	
	I-5 NB off to Old Highway 99	44	14	49	B	
	I-5 NB on	441	10	63	B	
	Old Highway 99 on to WB SR-432	243	16	51	B	
	SR-432 WB off to I-5 SB	35	14	47	B	
	SR-432 WB between I-5 SB on and SB off gore points	1,102	13	54	B	
	SR-432 WB on from I-5 SB	317	--	--	--	(2)
	SB off from I-5	402	15	58	B	
	SR-432 EB off to I-5 SB	887	--	--	--	(2)
	I-5 SB on	922	14	63	B	
	SR-432 EB between I-5 SB on and SB off gore points	393	--	--	C	
	SR-432 EB on from I-5 SB	85	10	51	B	
	SR-432 EB to I-5 NB	386	9	46	A	

(1) DHV means Design Hourly Volume.

(2) See I-5/Talley Way weaving area analysis.

Existing levels of service were reviewed from other recent traffic studies in the corridor vicinity. One 1996 study, the *Traffic Analysis for the Mint Farm Industrial Park*, included three intersections analyzed for this study: SR-432/38th Avenue, SR-432/Washington Way and SR-432/Oregon Way. The level of

service results were the same in both studies, except for the SR-432/Washington Way intersection which decreased from LOS B in the 1996 study to LOS C in this analysis, reflecting the traffic growth which has occurred in the corridor between 1996 and the present.

**Table 12**  
**Existing Highway Segment Levels of Service**

Segment Description	Type (1)	PM Peak Hour Volume		Speed (MPH)		LOS	
		EB	WB	EB	WB	EB	WB
SR-4 to 38 <sup>th</sup> Avenue (SRMP 0.00 - 3.33)	2 lane	150	280	--	--	C	C
38 <sup>th</sup> Avenue to Prudential Blvd. (SRMP 3.33 - 3.84)	Arterial	330	440	32	27	B	C
Prudential Blvd. to Washington Way (SRMP 3.84 - 4.43)	Arterial	520	585	37	34	A	B
Washington Way to Oregon Way (SRMP 4.43 - 6.05)	Arterial	580	470	32	39	B	A
3rd Avenue U-xing between Tennant Way WB and EB ramps (SRMP 7.64 - 8.17)	2 lane	1,080	650	--	--	E	E
Tennant Way on-ramp from 3rd Avenue to Dike Road (SRMP 8.17 - 9.38)	Multilane	1,630	1,305	55	55	B	B
Dike Road to Cowlitz River Bridge (SRMP 9.38 - 9.58)	Multilane	1,375	1,490	55	55	B	B

Source: Analysis by Parametrix using unpublished 1995 and 1997 count data from WSDOT, based on methodologies in the *1997 Highway Capacity Manual*.

Note: LOS means level of service.

(1) Type refers to the definition of highway type as identified in the Highway Capacity Manual.

### **Other Traffic Operations Issues**

There are a few traffic operations issues in the SR-432 corridor that are not reflected in the calculated levels of service. Until just recently, the signalized intersections of SR-432 with California Way and Industrial Way (which are about 300 feet apart) were operated separately, resulting in many drivers running red lights to avoid being stopped at the second signal. Since the analysis conducted for this study, the City of Longview has revised signal operations at both intersections to improve the coordination of service.

A second traffic operations concern involves delays attributable to train activity at the at-grade crossings along SR-432 and its adjacent roadways. As discussed in Chapter 3, some of the existing delays will be mitigated when both existing and future unit train activity is diverted to the alternate rail corridor. However, train crossing delays will continue to be experienced along Industrial Way, Oregon Way and California Way. This train activity includes all non-unit trains destined for the Port of Longview area, trains to Weyerhaeuser, Reynolds Aluminum, Prudential Steel and many other industrial users in the corridor.

**Table 13**  
**Existing Intersection Levels of Service**

No.	Intersection	Signalized Intersections		Unsignalized Intersections		
		Avg. Delay (sec.)	LOS	Approach	Avg. Delay (sec.)	LOS
1	SR-432/SR-4	18.8	B			
2	SR-432/Mt. Solo Road (SRMP 1.21)			SB EBL	5.1 0.2	B A
3	SR-432/Memorial Park Drive (SRMP 2.78)			SBLR EBL	4.8 2.8	A A
4	SR-432/38th Avenue	16.1	B			
5	SR-432/Prudential Drive	13.0	B			
6	SR-432/Weyerhaeuser Pulp Gate (SRMP 3.88)			NB SB WBL	7.6 10.7 3.4	B C A
7	SR-432/Washington Way	26.6	C			
8	SR-432/Weyerhaeuser-Norpac Entry/Exit (SRMP 4.72)			NB WBL	9.1 3.0	B A
9	SR-432/Weyerhaeuser/Douglas Street (SRMP 4.85)			NB SB EBL WBL	9.1 9.0 3.6 3.0	B B A A
10	SR-432/Weyerhaeuser-Norpac Entry/Exit (SRMP 5.95)			NB WBL	9.0 4.0	B A
11	SR-432/Oregon Way	26.5	C			
12	SR-432/Columbia Blvd.	5.3	A			
13	SR-432/International Way	5.9	A			
14	SR-432/Fibre Way	12.0	B			
15	SR-432/California Way	15.8	B			
16	SR-432/Industrial Way	7.9	A			
17	SR-432/Tennant Way EB off-ramp to 3 <sup>rd</sup> Avenue			EBL EBR	25.3 4.7	D A
18	SR-432/Tennant Way WB off-ramp to 3 <sup>rd</sup> Avenue	46.1	D			
19	SR-432 WB ramps/Talley Way			SBL WBLR	2.2 4.7	A A
20	I-5 NB off-ramp at Old Highway 99			SBL EBTR WBL WBR	3.2 7.2 13.3 3.7	A B C A

Source: Unpublished data developed for the SR-432 Route Development Plan, WSDOT and Parametrix, Inc.

Note 1: LOS means Level of Service.

Note 2: Intersection numbers correspond with numbers shown in Figure 7.

Note 3: Intersections on Industrial Way between Oregon Way and 3<sup>rd</sup> Avenue were analyzed using TRANSYT 7F signal progression software.

Key locations where rail crossing impacts will continue to be experienced include:

- Dike Road immediately south of SR-432 - this road currently accesses the county landfill. The development of the alternate rail corridor would not relieve existing and projected future unit train delays at this location.
- Industrial Way east of Oregon Way - non-unit trains destined for the Port of Longview area will continue to impact traffic operations at this crossing location.
- Oregon Way north of Industrial Way - Prudential Steel has increased rail activity at this crossing location. The alternate rail corridor will not relieve rail-related delays at this location.
- Industrial Way west of Oregon Way - similar to the Oregon Way crossing, this location will not be relieved by development of the alternate rail corridor and has been impacted by new rail traffic to/from Prudential Steel.
- Industrial Way west of Douglas Street - this crossing location will be impacted by the addition of rail traffic related to Prudential Steel.

A third key issue for SR-432 involves the number of driveways along Industrial Way between Oregon Way and California Way. This segment has over 50 driveways in less than a mile, which creates a significant number of vehicle conflict points resulting in both operational and safety problems. Access control issues are further addressed in Chapter 5 with recommended improvements.

## **EXISTING TRAFFIC ACCIDENTS**

Based on data collected and compiled by the Washington State Patrol, WSDOT periodically reviews traffic accident experience along SR-432 and has an on-going, internal process for identifying and evaluating High Accident Corridors (HACs) and High Accident Locations (HALs). Threshold criteria for designating High Accident Corridors and High Accident Locations include: total points per mile (based on point values assigned to accidents based on severity), number of accidents per mile, and average severity per mile. The threshold for total points per mile is 35 points. The threshold for total accidents per mile is 18 points. The average severity threshold is 2.0 points per accident.

HALs are reviewed every year and updated every two years based on the most recent two years of accident data. HAL calculations form the foundation for development of the short-term, safety improvement projects funded and implemented by the WSDOT on a regular basis. HACs are calculated every two years based on five years of data. They form the basis for the short- and longer-term safety improvements which are incorporated into the biennial *State Highway System Plan*. The DOT also identifies "Risk" improvements based on an assessment of accident potential for certain locations which do not meet HAL or HAC criteria.

There were no HALs, HACs or Risk locations identified in the 1999-2018 *State Highway System Plan* for the SR-432 corridor. However, the 2001-2003 Biennium update of accident analysis for the *State Highway System Plan* indicates that the intersection of SR-432 and SR-433 (Oregon Way at Industrial Way) has been identified as a High Accident Location (HAL) with signing and



advanced vehicle detection identified as mitigating improvements.

The identification of HACs and Risk improvements is important from the standpoint of longer-term planning such as is addressed in this document and in the *State Highway System Plan*. This identification is updated every two years and reviewed annually to ensure that safety improvement funding is directed to locations that evidence the most critical existing accident experience. Thus, as problem situations develop, improvement projects can be designed and evaluated to address them.

## **RAIL/HIGHWAY CONFLICTS**

As noted in the discussion in Chapter 3 of existing traffic operational issues in the SR-432 corridor and future rail activity, rail and vehicular traffic conflicts will remain even with construction of the alternate rail corridor. This rail corridor will provide access for all unit train activity to/from the Port of Longview and its vicinity, effectively removing this major source of roadway congestion from several of the most congested crossing locations. However, existing non-unit rail activity will continue to impact the at-grade crossing locations including 3rd Avenue, California Way, Oregon Way and Industrial Way at two locations. With the development of Prudential Steel at the Mint Farm site, additional rail traffic will be added to the SR-432 corridor, impacting most existing crossing locations between Dike Road and the crossing of Industrial Way west of Douglas Avenue.

The growth in rail activity in the SR-432 corridor will exacerbate the anticipated future congestion problems at several intersections.

Of particular significance is the impact of traffic signal pre-emption by trains at the intersection of Oregon Way with Industrial Way. This location is projected to operate at LOS E during the PM peak hour in 2017. Depending upon the specific train destination, this location could be impacted on the west, east and north approach legs. The growth in rail activity attributable to Prudential Steel and other Mint Farm tenants will also impact the busy portion of SR-432 between Oregon Way and Washington Way, which is projected to operate at LOS D during the 2017 PM peak hour with several side streets operating at LOS F where they intersect SR-432. Also significant would be the impact of train activity at the Dike Road at-grade crossing immediately south of SR-432 near the Cowlitz River. The Alternate Rail Corridor will not divert unit train activity from this location. Thus, it will be adversely impacted by both the additional rail traffic to/from the Port of Longview's export bulk terminal and Prudential Steel.

The affect of existing and future train activity on SR-432 is multi-fold. First, delays to vehicular traffic in a corridor which serves major employment and freight movement traffic can have significant cost implications to individuals and businesses. Delays can also cause a spillover of traffic from the state highway onto other arterial streets affecting the capacity of these facilities. This traffic spillover may impact existing residential neighborhoods and commercial areas within the City of Longview and the unincorporated county. Secondly, vehicular delays and street blockages can inhibit or restrict the access to a major industrial corridor by emergency vehicles or preclude the timely evacuation of the industrial area in the event of an emergency. Street blockages and delays caused by train activity crossing the state highway could potentially create an unsafe situation for workers and travelers alike.

## **PUBLIC INPUT ON CORRIDOR DEFICIENCIES**

A stakeholders group, comprised of business and property owners together with representatives from city, county, regional and state government, utility providers and the Port of Longview, has met to address corridor transportation issues. Key concerns raised by stakeholders and ideas for improvements included the following:

### **Truck Traffic**

- Truck traffic through the 3rd Avenue/Tennant Way interchange faces difficulties in both directions.
- Truck traffic in the corridor will increase in the future.

### **Property Access**

- Left turn access to properties along Industrial Way is important; driveway consolidation may not be well-received.
- Limited access along SR-432 where it exists today must be preserved in the future.
- Industrial Way may need to be widened between Oregon Way and Columbia Boulevard to provide protected left turn lanes.
- Additional signals would improve property access along Industrial Way.
- Provision of access to the portion of the Kelso industrial area south of SR-432 and west of I-5.

### **Congestion/Delay**

- Congestion at the 3rd Avenue/Tennant Way eastbound off-ramp intersection.
- Congestion caused by railroad crossings on 3rd Avenue and on Dike Road near the Talley Way interchange.
- Weaving and merging activity between the I-5/SR-432 interchange and the SR-432/Talley Way interchange.

### **Signage/Safety**

- Improved directional signage is needed (this point was not unanimous; others felt signage was adequate).
- Additional signs are needed to notify drivers of lane drops at Washington Way and Tennant Way.
- Traffic signals at Industrial Way/California Way and Industrial Way/3rd Avenue do not allow sufficient time for trucks to stop when the first light turns yellow.
- Safe facilities for bicyclists and pedestrians are lacking (some stakeholders also felt it was unwise to provide for bicycles at all on Industrial Way due to heavy truck traffic).
- Left turn lanes at some of the signals along Industrial Way are too short.
- Maintenance is needed in several places, including restriping and repaving.

## **LAND USE, FUTURE DEVELOPMENT AND TRAFFIC FORECASTING**

Analysis of future traffic conditions and improvement requirements for the SR-432 corridor is based on an assessment of future land use and development patterns in the Longview/Kelso urban area. Analysis was conducted using a PM peak hour traffic model development for the Route Development Planning study from the daily travel demand model previously prepared by the Cowlitz-Wahkiakum Council of Governments (CWCOG). The preparation of this model is described in greater detail in a separate technical memorandum submitted to CWCOG. Highlights of model development, as well as future land use and development patterns that formed the basis of future travel demand projections are described in the following paragraphs.

### ***Development of Peak Hour Traffic Forecasting Model***

A PM peak hour travel demand forecasting model was developed for the analysis of future traffic conditions using the T-Model2 software program. The model is a revision of the Cowlitz-Wahkiakum Council of Government's 1993 daily travel demand model. A peak hour model provides an effective tool for analyzing directional traffic flows in the corridor during evening peak periods, which are not captured in a daily model.

This section summarizes changes made to the model's roadway network, traffic analysis zone (TAZ) system and trip generation parameters in converting it to a peak hour model.

### **Network Modifications**

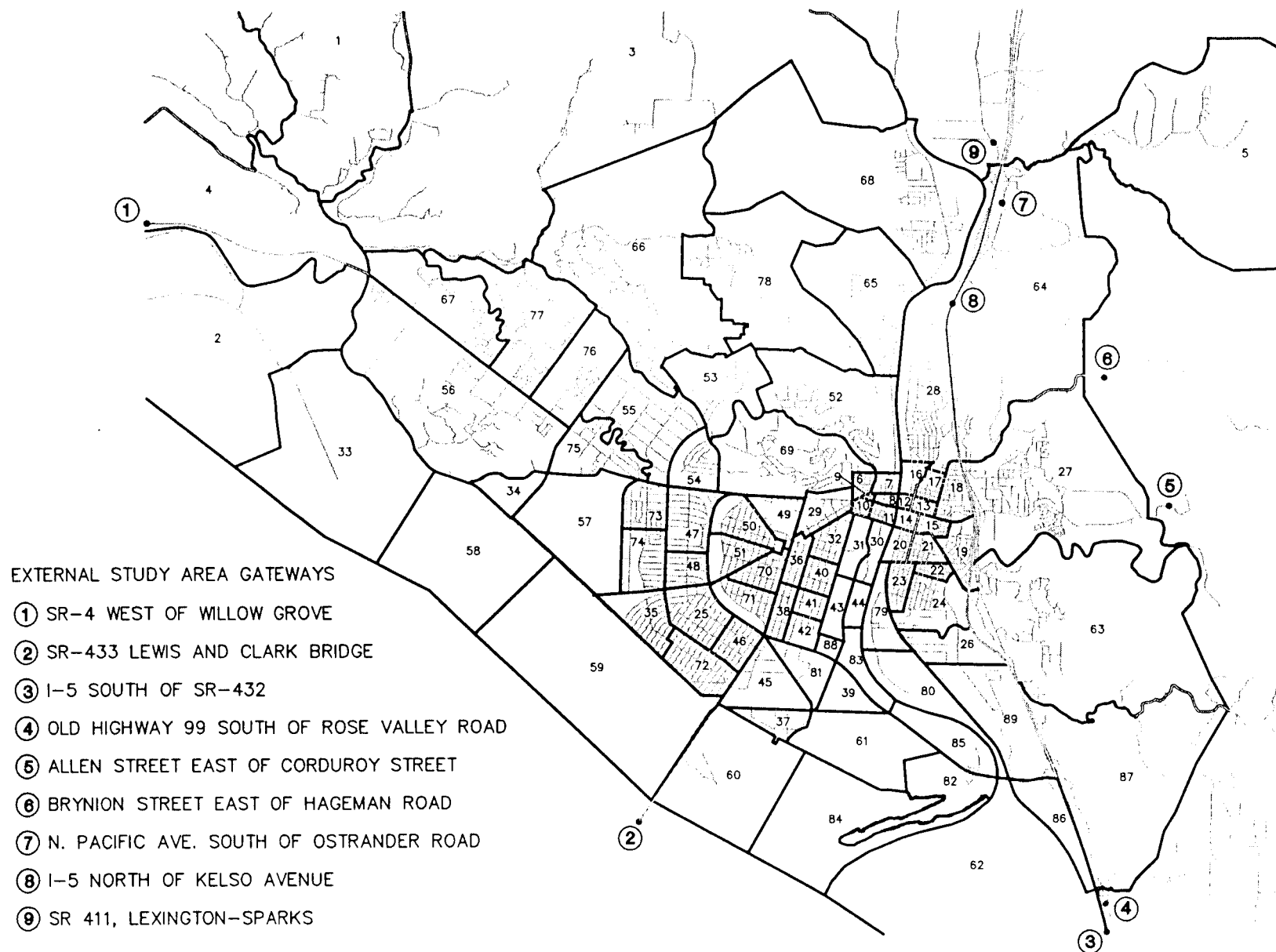
The peak hour model retains the same coverage area as the original daily model, from Coal Creek Road from the west to the eastern limits of Kelso east of I-5, and from the Columbia River north to Ostrander Road. Network enhancements were made in several locations, including south of SR-432 in the corridor's industrial area, at the SR-432 interchanges with Talley Way, Dike Road, in the Longview City center, along the 1st Avenue/3rd Avenue couplet between Hudson Street and the Allen Street Bridge, and along SR-433/Oregon Way.

### **Traffic Analysis Zone (TAZ) System and Trip Generation Factors**

Zone additions and refinements were made to the TAZ system for the peak hour model to provide a greater level of detail in the SR-432 corridor. Additionally, unused internal and external TAZ's were established for future use when the model is expanded to include the Rainier area south of the Columbia River. The revised TAZ system includes the following (see Figure 8 for internal TAZ boundaries and external zones or "gateways" to/from the study area):

- TAZ 1-89: internal zones
- TAZ 90-110: additional internal zones for future expansion of the model
- TAZ 111-119: external zones
- TAZ 120-130: additional external zones for future expansion of the model

Peak hour trip generation rates used in the model were allocated among three trip purposes: home-based work trips, home-based non-work trips, and non-home based trips. The initial peak hour trip generation rates and allocation by trip purpose were based on a travel demand model developed



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**Figure 8**  
**Traffic Analysis Zone Boundries**  
SR 432 ROUTE  
DEVELOPMENT PLAN

for Ellensburg, Washington and adjusted by data from other Pacific Northwest communities and by national data. Both the trip generation rates and trip purpose splits were adjusted during the calibration process to better represent local conditions.

### **Model Calibration**

Five screenlines were selected for the peak hour model calibration, representing major traffic movements through the study area. Screenlines are artificial lines drawn through several generally parallel roads serving the same or similar patterns of traffic and/or trip origins and destinations. Typically, screenlines are used to describe travel patterns within a corridor or to/from a major sub-area. For purposes of this study, traffic on the roads crossing the screenlines was identified from the travel demand model output. Data was summed by direction and then compared with existing traffic counts to determine where the model was predicting existing conditions well and where improvements to modeling parameters were necessary. This analysis process is referred to as model calibration.

During calibration, refinements were made to the model's street network, land use allocations and trip generation and distribution parameters to better replicate actual counts. The total screenline volume generated by the model is within two percent of actual counts, and within 15 percent of actual counts at all but one screenline. The results show a sound calibration for a peak hour model, particularly for the SR-432 industrial area. Further refinement of the model was conducted to replicate as closely as possible existing traffic counts on key roadway segments within the SR-432 corridor.

### ***Land Use Forecasts***

As noted above, the analysis of future traffic operations and identification of improvement requirements in the SR-432 corridor is based on forecasted land development and community growth in the Longview/Kelso urban area. Community growth is measured in terms of changes in single and multi-family residential development, and changes in retail and non-retail employment. Development of the growth assumptions used in the RDP planning study was a two step process including:

- Update of 1993 assumptions to 1995
- Forecasting of growth to the twenty-year planning horizon - 2017.

The 1993 daily travel demand model was updated for the RDP planning study to 1995 by CWCOC staff in consultation with local jurisdictions, and then reallocated to reflect the updated TAZ structure. 2017 housing and employment projections were based on the region's growth allocation in the State of Washington, that was subsequently allocated to the Longview-Kelso area and separated into metropolitan area TAZ's by CWCOC staff. 2017 TAZ allocations were subsequently confirmed by local agency staff and several major land owners.

Figure 9 shows major anticipated land development projects in the study area that are expected to be the primary source of socio-economic and demographic growth in the Longview/Kelso area over the next twenty years. Table 14 summarizes the study area housing, employment and student totals by category for the base year of the model (1995) and the forecasting horizon year (2017). Data for each traffic analysis zone is included in Appendix C.

**Table 14**  
**1995 and 2017 Housing, Employment and Students in Study Area**

<b>Land Use Category</b>	<b>1995</b>	<b>2017</b>	<b>Percent Increase 1995 – 2017</b>
Single family dwellings	17,387	22,432	20.0%
Multifamily dwellings	7,878	10,422	32.3%
Retail employees (1)	8,166	13,076	60.1%
Non-retail employees (2)	20,506	30,671	49.6%
Elementary/middle school students	11,500	11,500	(3)
High school students	6,500	6,500	(3)
College students	3,000	3,000	(3)

Source: Cowlitz-Wahkiakum Council of Governments

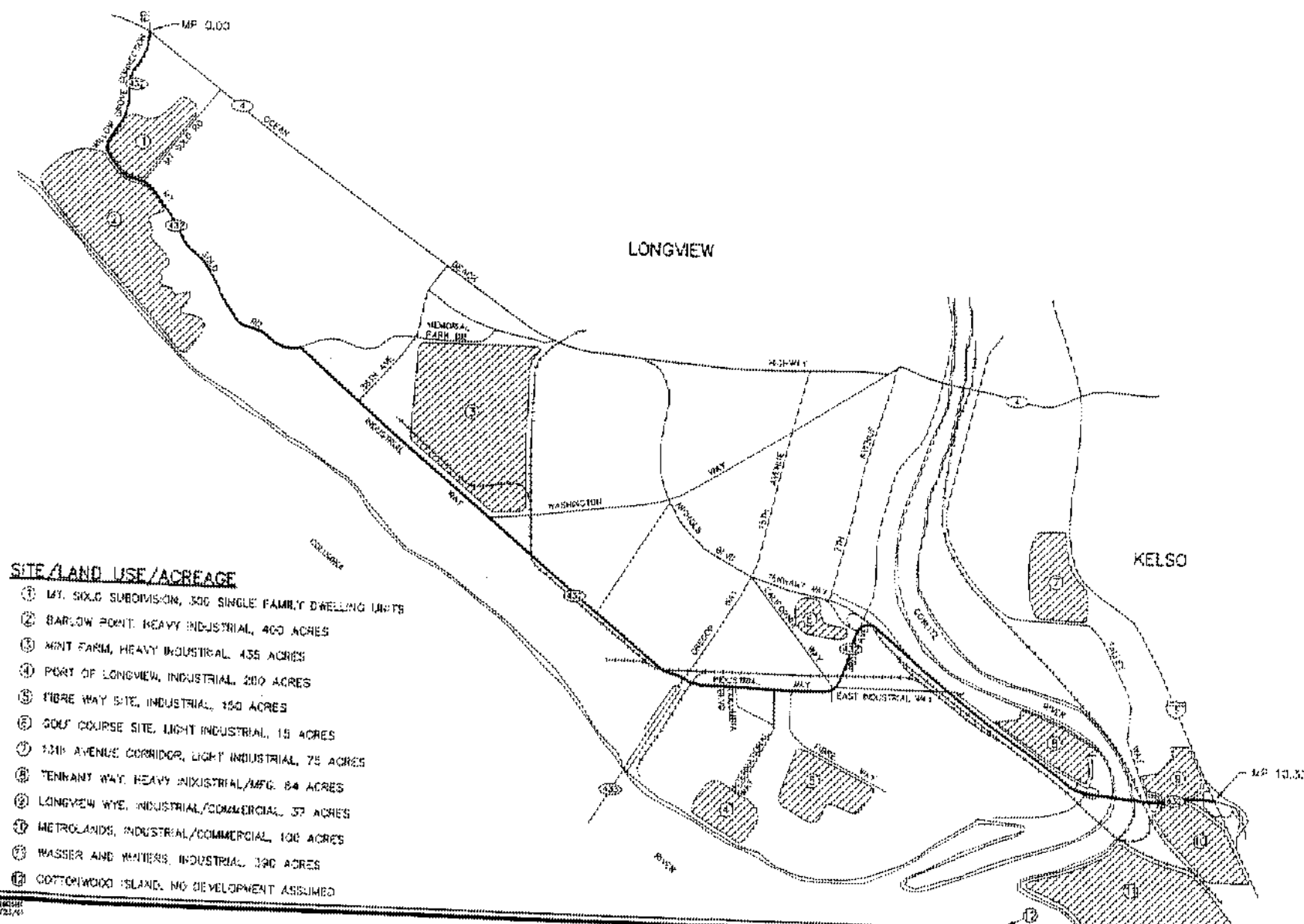
- (1) Wholesale trade, retail trade, finance, insurance, real estate, business, and repair services.
- (2) Manufacturing (durable and non-durable), transportation, communication, personal services, entertainment, health, other professional, public administration, armed forces, forestry, fishing, mining, construction and education.
- (3) No significant change has been identified in local student population.

## **2017 PM PEAK HOUR TRAFFIC VOLUMES**

Based on the population and employment forecasts described above, 2017 PM peak hour travel forecasts were developed using the PM peak hour model. In addition to accounting for growth within the Longview/Kelso urban area, external gateway traffic was also projected to increase. (External traffic enters the study area from outside the limits of the model, and either passes completely through the area, such as a trip along I-5, or has one trip end outside the area and the other within the area). External traffic increases at the major external gateways were obtained from WSDOT travel forecasting staff, while increases at the lesser gateways were based on both historical growth rates and growth rates comparable with the expected increase in trip-making within the study area between 1995 and 2017. Table 15 presents the travel growth rate assumptions.

The model forecasts were used to estimate the increment of traffic growth between 1995 and 2017, and to provide a general idea of future 2017 volumes. Travel demand models are useful tools to indicate trends and the magnitude of change in traffic volumes, but should not be relied upon to provide actual traffic volumes without adjustment.

The peak hour travel demand model indicates significant growth in traffic volumes throughout the SR-432 corridor from 1995 to 2017. At I-5, between the freeway and Talley Way, traffic on SR-432 in the eastbound peak direction is projected to increase by 78 percent for 2017, with a slightly lower increase in the off-peak westbound direction. Between 3rd Avenue and Oregon Way, westbound traffic is expected to increase by an average of 58 percent, while eastbound traffic would increase by an average of 68 percent. West of Oregon Way, where volumes are lower, the percentage increases are greater; more than doubling by 2017 in



comparison to 1995 levels. Peak hour volumes on the Lewis and Clark Bridge would increase by nearly 60 percent in 2017. Projected peak hour traffic volumes on these major roadway segments are expected to exhibit a nearly even directional split in most

locations. Exceptions would be west of Washington Way where traffic is expected to maintain a strong westward directional bias, and approaching I-5 where traffic would be expected to maintain a strong eastbound directional bias in the evening peak hour.

**Table 15**  
**2017 Projected Volumes at External Gateways**

No.	Street	Location	1995 Peak Hour Volume (Both Directions)	1995-2017 Annual Increase	Compounded 1995-2017 Increase	2017 Peak Hour Volume (Both Directions)
1	SR-4	West of Willow Grove	822	1.2%	30%	1,070
2	SR-433	Lewis & Clark Bridge	1,670	2.1%	57%	2,620
3	I-5 South	South of SR-432	5,110	2.4%	68%	8,600
4	Old Hwy 99	South of Rose Valley Road	100	0.0%	0%	100
5	Allen St.	East of Corduroy St.	80	1.0%	24%	90
6	Brynton Rd.	East of Hageman Rd.	50	1.8%	46%	80
7	N. Pacific Ave.	South of Ostrander Rd.	80	2.4%	68%	130
8	I-5 North	North of Kelso Ave.	3,710	2.9%	87%	6,930
9	SR-411	Lexington Avenue to Sparks Drive	870	2.4%	68%	1,460

Source: WSDOT and Cowlitz-Wahkiakum COG travel demand model.

Note: See Figure 8 for location of external gateways.

The travel demand forecasts and the level of service analysis described in the following sub-sections assume that there would be no roadway improvements other than those considered at the time of this analysis to be financially "committed" or otherwise expected to be in place by 2017. These assumed improvements are listed in Table 16. Each of these projects has been identified in an adopted or officially endorsed planning

document as follows: Project #1 - the Allen Street bridge project is currently under construction and anticipated to be complete by 2001; Projects #2 through #10 were identified in the *Cowlitz River Bridge Crossing Study* (CWCOG, 1996) and have been incorporated into the *Metropolitan Transportation Plan* (CWCOG, 1997); and Project #11 is included in the most recent *State Highway System Plan* (WSDOT, 1997).



**Table 16**  
**2017 Baseline Scenario - Summary of Improvements**

No.	Location	Improvement
1	Allen Street Bridge (1 <sup>st</sup> Avenue to 4th Avenue)	Replace existing bridge with grade-separated 4-lane facility and improvements to approach intersections.
2	West Side Highway (Sparks Drive to Lexington)	Install signals at Nevada and Alpha Drives; widen to two/three lanes at selected locations for safety.
3	1st Avenue W./3rd Avenue W. (Fishers Lane to Hudson Street)	Widen to three lanes, including new signal at Washington Street.
4	5th Avenue W. (Washington Way to Cowlitz Way)	Widen to two/three lanes.
5	Cowlitz Way (Ocean Beach Highway to 5 <sup>th</sup> Avenue W.)	Limited operational improvements.
6	3rd Avenue W. at Tennant Way	Install second westbound left turn lane.
7	Pacific Avenue (Church Street to Columbia Street)	Widen to four/five lanes; modify intersections.
8	I-5 Ramps at N. Kelso Avenue	Install signals.
9	West Side Highway at Sparks Drive to I-5 Interchange at Ostrander Road	Construct two-lane bridge; roadway approach and intersection improvements.
10	Footpath at N. Kelso Avenue/Redpath south of I-5	Install signal.
11	SR-4 (Coal Creek to I-5 including ramp termini)	Channelization and signals at selected intersections.

Note: Improvements listed in this table are identified in the *Metropolitan Transportation Plan*, the *State Highway System Plan*, or are currently under design. All improvements listed in this table are assumed to be in place by 2017.

## **2017 BASELINE HIGHWAY LEVELS OF SERVICE**

As noted earlier in this chapter, the *State Highway System Plan* objectives call for level of service D as a minimum acceptable traffic operating condition in urban areas (SR-4 to I-5). Table 17 presents a summary of the analysis of SR-432 interchange areas including ramps and weaving segments at: the SR-432 (Tennant Way)/3rd Avenue interchange, the SR-432/Talley Way interchange, the freeway segment between the Talley Way interchange and the I-5 interchange, and the SR-432/I-5 interchange.

The weaving area between the I-5 southbound

to SR-432 westbound ramp and the westbound Talley Way off-ramp are expected to operate at LOS F, while the non-weaving area for this highway segment is expected to operate at LOS E. The westbound off-ramp at Talley Way is impacted by the proximity of the I-5 southbound off-ramp and the very short weaving and merging distance currently available between the two interchanges. Weaving impacts are anticipated to be significant enough to also reduce LOS for the non-weaving roadway segment. LOS E conditions are anticipated in the eastbound weaving area between the Talley Way on ramp and the off-ramp to I-5 southbound, while the non-weaving area would experience LOS F.

**Table 17**  
**2017 SR-432 Interchange Area Levels of Service**

Location	Movement	DHV (1)	Density	Speed	LOS	Comments
Talley Way to I-5	Westbound on SR-432	790	--	34	F	Weaving
		1,400	--	39	E	Non-weaving
	Eastbound on SR-432	630	--	37	E	Weaving
		1,760	--	34	F	Non-weaving
I-5 at SR-432	I-5 NB off	1,770	28	56	D	
	I-5 NB off to Old Highway 99	280	23	48	C	
	I-5 NB on	640	21	58	C	
	Old Highway 99 on to SB SR-432	330	23	50	C	
	SR-432 WB off to I-5 SB	60	21	47	C	
	SR-432 WB between I-5 SB on and SB off gore points	1,760	21	54	C	
	SR-432 WB on from I-5 SB	430	--	--	--	(2)
	I-5 SB off	510	21	58	C	
	SR-432 EB off to I-5 SB	1,650	--	--	--	(2)
	I-5 SB on	1,710	27	58	C	
	SR-432 EB between I-5 SB on and SB off gore points	745	--	--	D	
	SR-432 EB on from I-5 SB	75	13	51	B	
	SR-432 EB to I-5 NB	585	13	46	B	

(1) DHV means Design Hourly Volume.

(2) See I-5/Talley Way weaving area analysis.

Outside of the impacts associated with the I-5 to Talley Way traffic movements, ramps to, from and through the interchange of SR-432 and I-5 are expected to operate at acceptable LOS D or better during the 2017 PM peak hour.

Based on analysis of 2017 PM peak hour traffic volumes on major highway segments in the corridor, it is anticipated that the

westbound segment of SR-432 between Washington Way and Oregon Way will operate at LOS D during the PM peak hour. LOS E would be experienced on the constrained section of 3<sup>rd</sup> Avenue beneath Tennant Way. 2017 highway levels of service are presented in Table 18. It should be noted that the effective, operational service level will likely be lower if railroad conflicts are considered in Table 18.

**Table 18**  
**2017 Highway Segment Levels of Service**

Segment Description	Type	PM Peak Hour Volume		Speed (MPH)		LOS	
		EB	WB	EB	WB	EB	WB
SR-4 to 38 <sup>th</sup> Avenue (SRMP 0.00 - 3.33)	2 lane	340	625	--	--	D	D
38 <sup>th</sup> Avenue to Prudential Blvd. (SRMP 3.33 – 3.84)	Arterial	680	1,080	31	23	B	C
Prudential Blvd. to Washington Way (SRMP 3.84 - 4.43)	Arterial	845	970	36	33	A	B
Washington Way to Oregon Way (SRMP 4.43 - 6.05)	Arterial	725	870	34	21	B	D
3 <sup>rd</sup> Avenue U-xing to Tennant Way on-ramp from 3rd Avenue (SRMP 7.64 - 8.17)	2 lane	790	1,265	--	--	E	E
Tennant Way on-ramp from 3rd Avenue to Dike Road (SRMP 8.17 - 9.38)	Multilane	2,375	2,290	55	55	C	C
Dike Road to Cowlitz River Bridge (SRMP 9.38 - 9.58)	Multilane	2,165	2,445	55	55	C	C

Source: Analysis by Parametrix using 2017 PM peak hour forecasts for the No Build condition and based on methodologies in the *1997 Highway Capacity Manual*.

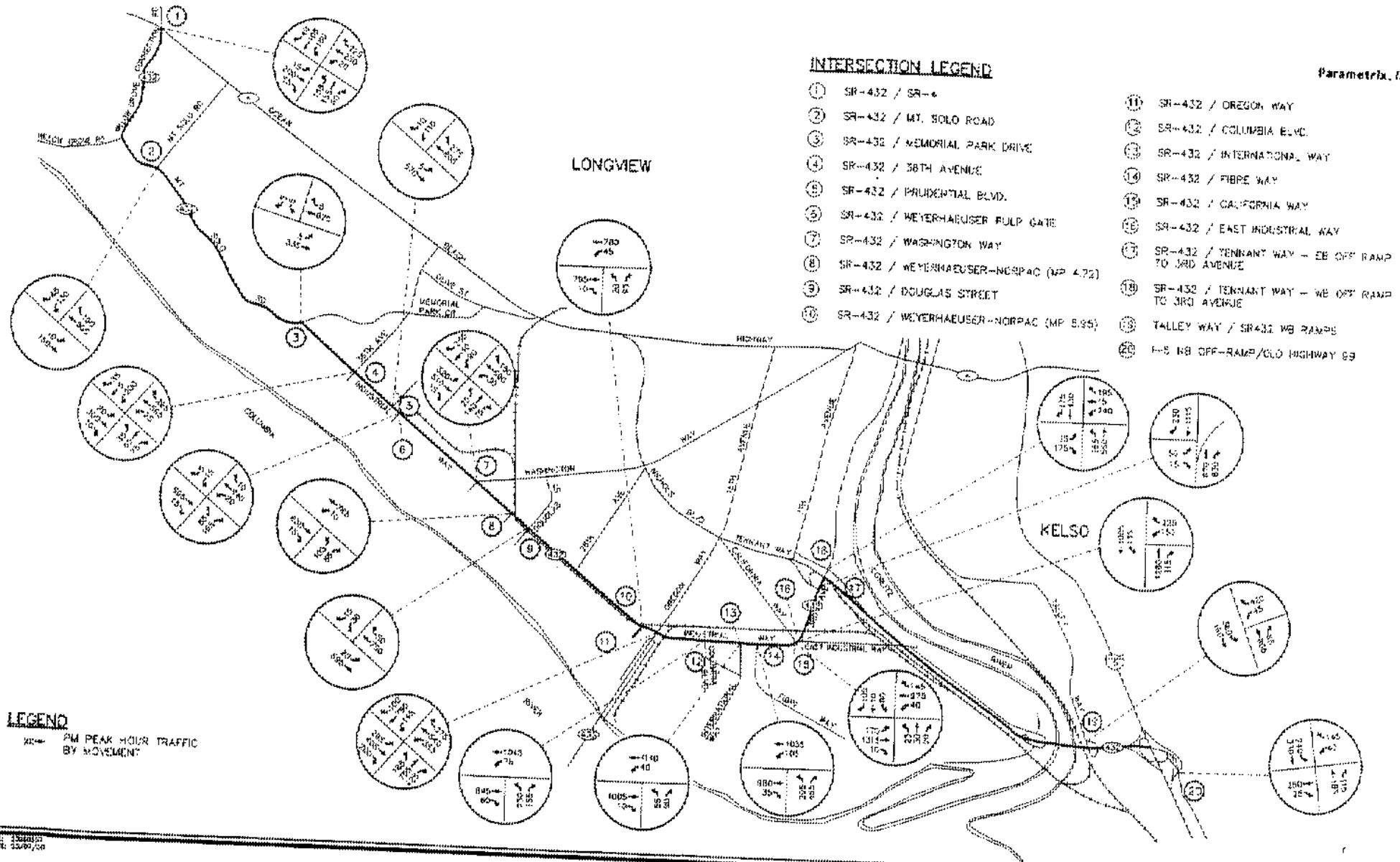
Note: LOS means level of service.

## **2017 BASELINE INTERSECTION LEVELS OF SERVICE**

Projected 2017 turning movements at the study area intersections were determined by refining the 2017 model forecasts to reflect specific traffic patterns affecting the individual intersections. The refined 2017 turn movements are illustrated in Figure 10. These volumes were used to calculate levels of service for future baseline conditions at twenty intersections along the SR-432 corridor.

2017 baseline levels of service are shown in Table 19. Two signalized intersections are

projected to operate at LOS E or LOS F by 2017 without improvements (SR-432/Oregon Way and SR-432/3rd Avenue/Tennant Way westbound off-ramp). In addition, side street left turns at seven of the unsignalized study area intersections east of 38th Avenue are projected to operate at level of service F. This means that traffic attempting to turn from these side streets (or property access roadways) will experience significant delays waiting for a gap in through traffic on SR-432. Although the remaining study area intersections would carry significantly higher traffic volumes, intersection operation is projected to remain at or above LOS D.



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**Table 19**  
**Existing and 2017 Intersection Levels of Service**

Signalized Intersections							
No.   Intersection		1997		2017			
		Avg. Delay (sec.)	LOS	Avg. Delay (sec.)	LOS		
1	SR-432/SR-4	18.8	B	21.7	C		
4	SR-432/38th Avenue	17.6	B	20.4	C		
5	SR-432/Prudential Blvd.	13.0	B	14.1	B		
7	SR-432/Washington Way	26.6	C	36.1	D		
11	SR-432/Oregon Way	26.5	C	70.9	E		
12	SR-432/Columbia Blvd.	5.3	A	16.1	B		
13	SR-432/International Way	5.9	A	7.4	A		
14	SR-432/Fibre Way	12.0	B	22.8	C		
15	SR-432/California Way	15.8	B	20.1	C		
16	SR-432/Industrial Way	7.9	A	15.1	B		
18	SR-432 Tennant Way WB off ramp/3rd Avenue	46.1	D	>80.0	F		
Unsignalized Intersections							
Intersection		Approach	Avg. Delay (sec.)	LOS	Approach	Avg. Delay (sec.)	LOS
2	SR-432/Mt. Solo Road (SRMP 1.21)	SB	5.1	B	SB	17.5	C
		EBL	0.2	A	EBL	4.8	A
3	SR-432/Memorial Park Drive (SRMP 2.78)	SBLR	4.8	A	SBLR	9.9	B
		EBL	2.8	A	EBL	4.4	A
6	SR-432/Weyerhaeuser Pulp Gate (SRMP 3.88)	NB	7.6	B	NB	>45	F
		SB	10.7	C	SB	>45	F
		WBL	3.4	A	WBL	5.4	B
8	SR-432/Weyerhaeuser-Norpac Entry/Exit (SRMP 4.72)	NB	9.1	B	NB	>45	F
		WBL	3.0	A	WBL	4.5	A
9	SR-432/Weyerhaeuser/Douglas Street (SRMP 4.85)	NB	9.1	B	NB	>45	F
		SB	9.0	B	SB	29.9	D
		EBL	3.6	A	EBL	5.5	B
		WBL	3.0	A	WBL	4.7	A
10	SR-432/Weyerhaeuser-Norpac Entry/Exit (SRMP 5.95)	NB	9.0	B	NB	>45	F
		WBL	4.0	A	WBL	7.0	B

Source: Unpublished analysis developed for the *SR-432 Route Development Plan*, WSDOT and Parametrix, Inc.

Note 1: LOS means Level of Service.

Note 2: Intersection on Industrial Way between Oregon Way and 3<sup>rd</sup> Avenue were analyzed using TRANSYT 7F signal progression software.

**Table 19 Continued**  
**Existing and 2017 Intersection Levels of Service**

<b>Unsignalized Intersections</b>							
<b>No.</b>	<b>Intersection</b>	<b>1997</b>			<b>2017</b>		
		<b>Approach</b>	<b>Avg. Delay (sec.)</b>	<b>LOS</b>	<b>Approach</b>	<b>Avg. Delay (sec.)</b>	<b>LOS</b>
17	SR-432 Tennant Way EB ramps/ 3rd Avenue	EBL EBR	25.3 4.7	D A	EBL EBR	>45 6.3	F B
19	Talley Way/SR-432 WB Ramps	SBL WBLR	2.2 4.7	A A	SBL WBLR	16.9 >45	C F
20	I-5 NB off-ramp/Old Highway 99	SBL EBTR WBL WBR	3.2 7.2 13.3 3.7	A B C A	SBL EBTR WBL WBR	3.9 >45.0 >45.0 4.2	A F F A

Source: Unpublished analysis developed for the *SR-432 Route Development Plan*, WSDOT and Parametrix, Inc.

Note: LOS means Level of Service.

## **SUMMARY OF EXISTING AND 2017 BASELINE TRANSPORTATION PROBLEMS**

The development of transportation system improvements will address both the short- and long-term circulation needs as identified in this chapter. These improvements will be discussed in detail in Chapter 5 and will address the following specific needs.

### **Existing (1997) Transportation Problems in the SR-432 Corridor**

- Congestion at the intersection of the westbound ramp from Tennant Way to 3<sup>rd</sup> Avenue and in the weaving area between the westbound SR-432 on-ramp from I-5 and the off-ramp at Talley Way.
- Frequent curb cuts along Industrial Way between 3<sup>rd</sup> Avenue and Oregon Way that result in conflicts between local and through traffic and interfere with the movement of bicycles and pedestrians in the corridor. Access consolidations will

be difficult due to existing abundance of driveways and patterns of land parcelization.

- Delays due to frequent rail crossings.
- Inadequate directional signing and advance warning of lane changes
- Problems with the movement of traffic along Industrial Way including the need for safer left turns west of Columbia Boulevard and traffic signal timing improvements at the eastern end of Industrial Way.
- Safer facilities for pedestrians and bicyclists

### **2017 Baseline Transportation Problems in the SR-432 Corridor**

By 2017, without transportation system improvements and with the expected growth and development in the corridor, several

significant congestion problems will likely develop including:

- Substandard levels of service at the intersections of Industrial Way with Oregon Way, the intersection of the Tennant Way westbound off-ramp at 3rd Avenue, and the intersection of the I-5 northbound off-ramp with Old Highway 99.
- Major delays for traffic exiting Weyerhaeuser onto Industrial Way at all four major access roads.
- Continued traffic delays due to rail operations that will not be solved by

constructing the Alternate Rail Corridor. This includes rail service to Weyerhaeuser, Reynolds Aluminum, Prudential Steel and others in the corridor.

- Major delays for traffic turning left from the Tennant Way eastbound off-ramp at 3<sup>rd</sup> Avenue.
- Significant deterioration in traffic operations at the I-5/SR-432/Talley Way interchange area resulting in increased delays and accident potential.

## CHAPTER 5

### ROUTE IMPROVEMENTS

This chapter presents a discussion of transportation system improvement alternatives and recommended short- and long-term actions. Included are the following:

- Development of goals for corridor improvement and evaluation criteria to assess the relative merits of various improvement options;
- An overview of the preliminary screening of improvement options as conducted for Phase 1 of the RDP and refined in Phase 2; and
- A detailed assessment of final improvement alternatives and recommendations by segment in the corridor.

#### **CORRIDOR GOALS AND EVALUATION CRITERIA**

Goals are typically broad statements of intent that indicate a desired end state. For transportation improvements, they usually focus on the problems to be addressed and the context within which the improvements should be refined and implemented. For example, a goal may be to improve traffic operations at locations not meeting a minimum acceptable level of delay, while not adversely impacting the community or natural environment.

Goals are usually further refined through the development of objectives and evaluation criteria that specifically address the issues of importance to consider in making a decision

about solutions to the identified problems. For example, minimizing community or natural environmental impacts may be more concisely defined by such factors as minimizing exposure of residential areas to cut-through traffic or noise impacts, or mitigating potential impacts to wetlands or waterways.

Evaluation criteria are used as a tool in assessing the degree to which each transportation improvement or package of improvements meets the expressed needs and desires of the community. These criteria help with the decision-making process by laying out the implications of each possible course of action, identifying trade-offs and allowing decision-makers to focus on the issues that are of most concern. The degree to which evaluation criteria are met determines how well each improvement alternative or group of alternatives achieves the goals of the community.

#### **Corridor Goal and Objectives**

The primary goal of the SR-432 Route Development Plan is to address the identified short-and long-term transportation system problems. More specifically, the study should address the following objectives:

1. Develop an improvement package to address the transportation problems identified west of Oregon Way, including excessive delays to traffic entering SR-432 from side streets, and congestion and confusion due to changes in the number of through



- lanes. Develop recommendations on access for future development.
2. Develop an improvement package to address short-term transportation needs along Industrial Way east of Oregon Way.
3. Develop a recommended alignment for SR-432 east of the Oregon Way vicinity that addresses, as appropriate, the need for roadway widening, development of a new alignment, and/or development of new or improved interchanges.
4. Address access requirements and potential control of access to SR-432 east of Oregon Way.
5. Address multi-modal transportation needs along the entirety of the SR-432 corridor.
6. Provide guidance needed by the Washington DOT in cooperation with local governments to plan, program and fund roadway improvements in the SR-432 corridor.
2. Improves roadway safety through geometric design or by addressing locations presently experiencing a correctable pattern of traffic accidents.
3. Accommodates bicycle, pedestrian, and transit modes.
4. Achieves access control consistent with the designated functional classifications of each roadway segment.
5. Minimizes adverse impacts to the built environment expressed in terms of:
  - Potential for residential neighborhood traffic intrusion.
  - Impacting fewer properties outside of the existing right-of-way thus reducing the need for displacements and/or right-of-way acquisition.
  - Noise impacts on sensitive receptors.
6. Minimizes adverse impacts on the natural environment expressed in terms of:
  - Impacts on existing wetlands
  - Impacts on existing waterways with threatened or endangered species.
  - Impacts on other sensitive lands as identified through the Cowlitz County GIS mapping resources.
  - Potential air quality impacts.
  - Potential drainage and water quality impacts.

### ***Evaluation Criteria***

A draft set of evaluation criteria were developed to define the issues or factors of importance to the community in selecting the transportation improvements that attempt to achieve these goals. Evaluation criteria identified for the *SR-432 Route Development Plan* include the following:

1. Achieves acceptable intersection and/or roadway segment/ramp levels of service as defined by the *Highway Capacity Manual* and local level of service standards or practices.
7. Cost and benefit/cost ratio of improvements.
8. Constructability of improvements measured in terms of:
  - Engineering constructability and options for project phasing

- Public acceptance.
9. Integration with existing and proposed future rail system and reduction of existing and likely future rail/vehicular traffic conflicts and delays.
  10. Other factors determined to be of importance in screening improvement alternatives.

## **PRELIMINARY SCREENING OF IMPROVEMENT OPTIONS**

Initial analysis conducted to identify and refine improvement recommendations for the SR-432 corridor included the preliminary screening of a wide variety of improvement options. This screening process was conducted in two steps. The first step was conducted during Phase 1 of the RDP planning study. It involved conceptualizing a total of thirteen (13) improvement options and then using the PM peak hour travel demand forecasting model to screen these options based on relative effectiveness in addressing the identified transportation system problems. These thirteen (13) options included recommendations from previous studies, as well as new improvements that included the combined elements of other options. The alternatives addressed both existing and likely future baseline deficiencies in the corridor, as well as access needs for future development that is presently under-served by transportation facilities (including but not limited to the Longview Wye/Metrolands, the Wasser-Winter property and Cottonwood Island).

The alternatives were screened by reviewing projected link volumes in general, and by comparing link volumes and volume-to-

capacity ratios at the same five specific locations within the corridor:

- Industrial Way west of 26th Avenue;
- Industrial Way between Fibre Way and International Way;
- 3rd Avenue north of Industrial Way;
- Tennant Way/SR-432 Cowlitz River Bridge; and
- Tennant Way southbound ramps to I-5

In consultation with the study's Technical Advisory Committee (TAC), nine options were recommended to be carried forward into the Phase 2 RDP study. The options included a combination of recommended improvements from previous studies, concepts for new roadways and connections developed as part of this study, and various combinations of both new and old recommendations. The nine options recommended for further analysis are described in greater detail in the Phase 1 Report and included:

- Alternative E - New Cowlitz River Bridge
- Alternative F - Widen Industrial Way from 38th Avenue to Oregon Way
- Alternative G - Industrial Way bypass route plus Fibre Way local access extension
- Alternative H - Fibre Way extension combined with SR-433 grade separation
- Alternative I - New Cowlitz River Bridge and new I-5 interchange
- Alternative K - Industrial Way bypass to new interchange ramps at Tennant Way
- Alternative L - Extend Industrial Way to new interchange ramps at Tennant Way
- Alternative M - Widen Industrial Way to four lanes from Oregon Way to Talley Way
- Alternative N - Improve access to Kelso industrial area south of SR-432.

In addition to these options, the TAC recommended further analysis of improvements to the SR-432 interchanges at I-5 and Talley Way to eliminate the eastbound and westbound weaves on SR-432 and to provide access to Cottonwood Island, Metrolands, and Wasser-Winter properties.

## **DEVELOPMENT OF RECOMMENDATIONS**

At the conclusion of the Phase 1 study, it became apparent that analysis of the SR-432 corridor should be considered in segments to best define the nature of existing and future problems and to facilitate the development of improvement alternatives. Five segments were identified and illustrated in Figure 11, including:

- Segment 1 – SR-4 to 38<sup>th</sup> Avenue;
- Segment 2 – 38<sup>th</sup> Avenue to west of Oregon Way;
- Segment 3 – West of Oregon Way to Tennant Way/3<sup>rd</sup> Avenue interchange vicinity;
- Segment 4 – Tennant Way/3<sup>rd</sup> Avenue vicinity to Cowlitz River Bridge; and
- Segment 5 – Cowlitz River Bridge to I-5.

Based on the initial work in identifying improvement options during Phase 1, a number of improvement options were formulated for segments 2, 3 and 5. Improvement options for segments 1 and 4 were not identified in Phase 1 due to lack of existing or potential future deficiencies. Individual improvements in segments 2, 3, and 5 could be combined with improvements in other segments to develop a comprehensive strategy for improvement of the SR-432 corridor.

A comprehensive strategy was developed by

selecting component improvements in each segment that offered the most promise of improving traffic operations with minimal negative impacts. Numerous combinations of improvement options in various segments were analyzed to identify not only how well the improvement would perform within its roadway segment, but also how well it worked in combination with improvement options in other roadway segments. Improvement options considered in roadway segments 2, 3 and 5 are described later in this chapter.

Improvement and alternatives and recommendations in each of these segments are discussed in the following paragraphs. Projected roadway and intersection traffic volumes with the recommended improvements in place are shown in Figure 17 in the following section entitled “Summary of Recommended Improvements”. Levels of service for 2017 PM peak hour conditions for highway segments and intersections with the recommended improvements are also presented in the “Summary of Recommended Improvements” section in Tables 23 and 24, respectively.

### **Segment 1 – SR-432 Between SR-4 and 38<sup>th</sup> Avenue**

Analysis of existing and 2017 baseline PM peak hour intersection and roadway levels of service identified no deficiencies in this section. Accordingly, no improvements are proposed.

In conjunction with the recommended Industrial Way Bypass in the central portion of the corridor, some increase in 2017 PM peak hour traffic volumes is anticipated in this segment which would reduce roadway levels of service to a borderline “D/E” condition. However, due to uncertainty involved in these long-term projections and the marginal nature

Figure 11 – Corridor Segments

of the impact, it is not recommended that improvements be undertaken in this segment in conjunction with the bypass. It is recommended that this segment be further considered after completion of the bypass when actual traffic diversion from SR-4 and other parallel routes can be observed.

Consistent with the minimum geometric design standards, desirable shoulder width is 8 feet for a minor urban arterial such as SR-432 in this segment. Existing shoulder width varies from 6 to 9 feet with some 3-foot sections. If future improvements are made to SR-432 in this segment, these improvements should include shoulder widening where necessary to meet the 8-foot standard.

Several portions of the existing roadway in this segment may be outside of the existing right-of-way. These are at station 100+00 lt., station 109+00 lt., and station 129+80 rt. Through prescriptive rights, WSDOT controls the area that must be maintained to preserve the integrity of the roadway, which would be the back of ditch or the end of each drainage structure. Additional right-of-way should not be required unless or until the roadway is widened in the future.

## ***Segment 2 – SR-432 Between 38<sup>th</sup> Avenue and West of Oregon Way***

Between 38<sup>th</sup> Avenue and west of Oregon Way (approximately SRMP 5.95), analysis was conducted of traffic operations along roadway segments and at intersections to identify any existing or potential future (2017) deficiencies. Congestion problems were identified at several locations and two improvement options were developed and evaluated to address these deficiencies:

- Widen SR-432 to four through lanes (two in each direction) with left turn

lanes (and traffic signals if warranted) at key intersections.

- Install left turn lanes and traffic signals (if warranted) at key intersections along SR-432. Retain existing roadway cross-section at other locations.

Some of the key issues that were considered in the review of these options included: proximity to rail lines, available right-of-way, traffic operational improvements, concerns about stormwater drainage, and potential wetland encroachment.

Evaluation of the two improvement options indicated that during the projected 2017 PM peak hour there would not be sufficient congestion on the roadway or at the intersections to warrant full widening of this road to a five-lane cross-section between the major intersections. Spot improvements were recommended to address specific, localized congestion problems including:

- SR-432/Weyerhaeuser Pulp Gate (SRMP 3.88) at Interlox – LOS F would be experienced for northbound and southbound movements from the minor streets. Relocation of this access road to become the southerly leg of the existing signalized intersection of SR-432 and Prudential Boulevard was recommended. This would be largely, if not completely, a privately-funded project with the objective of improving property access at this location.
- Intersection of SR-432 with Washington Way which would operate at an overall LOS D with several individual movements at the intersection operating at LOS E or F. The addition of a second westbound through lane at this location was recommended to reduce signal

green time requirements for the east-west through movements and improve overall traffic operations.

- At several of the currently unsignalized intersections along SR-432 west of Oregon Way, side-street traffic is expected to experience LOS F in the 2017 PM peak hour. The availability of gaps for left turning traffic from these side streets onto the highway will be particularly problematic. Signal warrant analysis was conducted at each unsignalized intersection to identify locations where signalization would be appropriate by 2017. Only one location is recommended for such an improvement – the intersection of SR-432 with the Norpac entrance road (at SRMP 4.72).

Roadway improvements for this section of SR-432 are illustrated in Figures 12A and 12B and include the following:

1. Relocation of the Weyerhaeuser Pulp Gate Access currently located at SRMP 3.88 is recommended to be relocated to form the southerly leg of the existing signalized intersection with Prudential Boulevard (SRMP 3.84). The existing approach opposite Interlox is not proposed to be signalized due to low traffic volumes and proximity to Prudential Boulevard.
2. A second westbound through lane is proposed to be added at the Washington Way intersection to improve east-west traffic flow through this intersection.
3. The existing intersection at Norpac/Weyerhaeuser (SRMP 4.72) is stop sign-controlled for side street movements and will experience poor levels of service as through traffic volumes increase on SR-432. A signal warrant analysis was

conducted based on 2017 PM peak hour traffic volumes. This analysis indicated that peak hour warrants would likely be met at this location, and accordingly, signalization was recommended.

At two locations in this segment, side street traffic volumes are not anticipated to be sufficiently high to trigger signalization or other improvement to projected LOS F conditions during the 2017 PM peak hour. These are located at SRMP 3.88 for the southbound egress from Interlox, and at SRMP 4.85 for the northbound egress from Weyerhaeuser opposite Douglas Street. At the Interlox intersection, no mitigation is reasonably available. At the Weyerhaeuser location, consideration should be given to consolidation of this driveway's function with a signalized access point or to the use of the driveway primarily for right turn egress only (right and left turn entrance could be provided at acceptable levels of service).

These proposed improvements address all of the deficiencies identified in the analysis of 2017 PM peak hour conditions with or without the addition of the Industrial Way Bypass further east.

Consistent with the minimum geometric design standards, desirable shoulder width is 8 feet in this segment for a minor urban arterial such as SR-432 between 38<sup>th</sup> Avenue and Washington Way and an urban principal arterial such as SR-432 between Washington Way and Oregon Way. Existing shoulder width varies from 3 to 10 feet. As future improvements are made to SR-432 in this segment, these improvements should include shoulder widening where necessary to meet the 8-foot standard. The addition of bicycle facilities and/or sidewalks is not recommended.

### ***Segment 3 – SR-432 Between West of Oregon Way and Tennant Way/3<sup>rd</sup> Avenue Vicinity***

Several locations were identified where improvements would be necessary to address PM peak hour congestion and circulation problems with the 2017 baseline condition including:

- SR-432/Weyerhaeuser/Norpac (SRMP 5.95) – LOS F for northbound movement.
- SR-432/Oregon Way (SRMP 6.10) – LOS E overall with some movements at LOS F
- SR-432/Tennant Way eastbound ramps to 3<sup>rd</sup> Avenue – LOS F for eastbound left turns
- SR-432 under Tennant Way between the east- and westbound ramps – LOS E
- SR-432/Tennant Way westbound ramps to 3<sup>rd</sup> Avenue – LOS F for overall intersection

To address the deficiencies in this segment, short- and long-term improvements have been recommended.

#### **Short-Term Improvements**

In the short-term, improvements are recommended along Industrial Way/3<sup>rd</sup> Avenue between Oregon Way and Tennant Way. These include: improvements to signal progression along this street, addition of a second westbound left turn lane at the intersection of the Tennant Way westbound ramp with 3<sup>rd</sup> Avenue to accommodate existing high peak hour volumes at this location, and the provision of two-way left turn channelization along Industrial Way between Oregon Way and Columbia Way. Proposed dual westbound left turn lane improvements at Tennant Way/3<sup>rd</sup> Avenue are

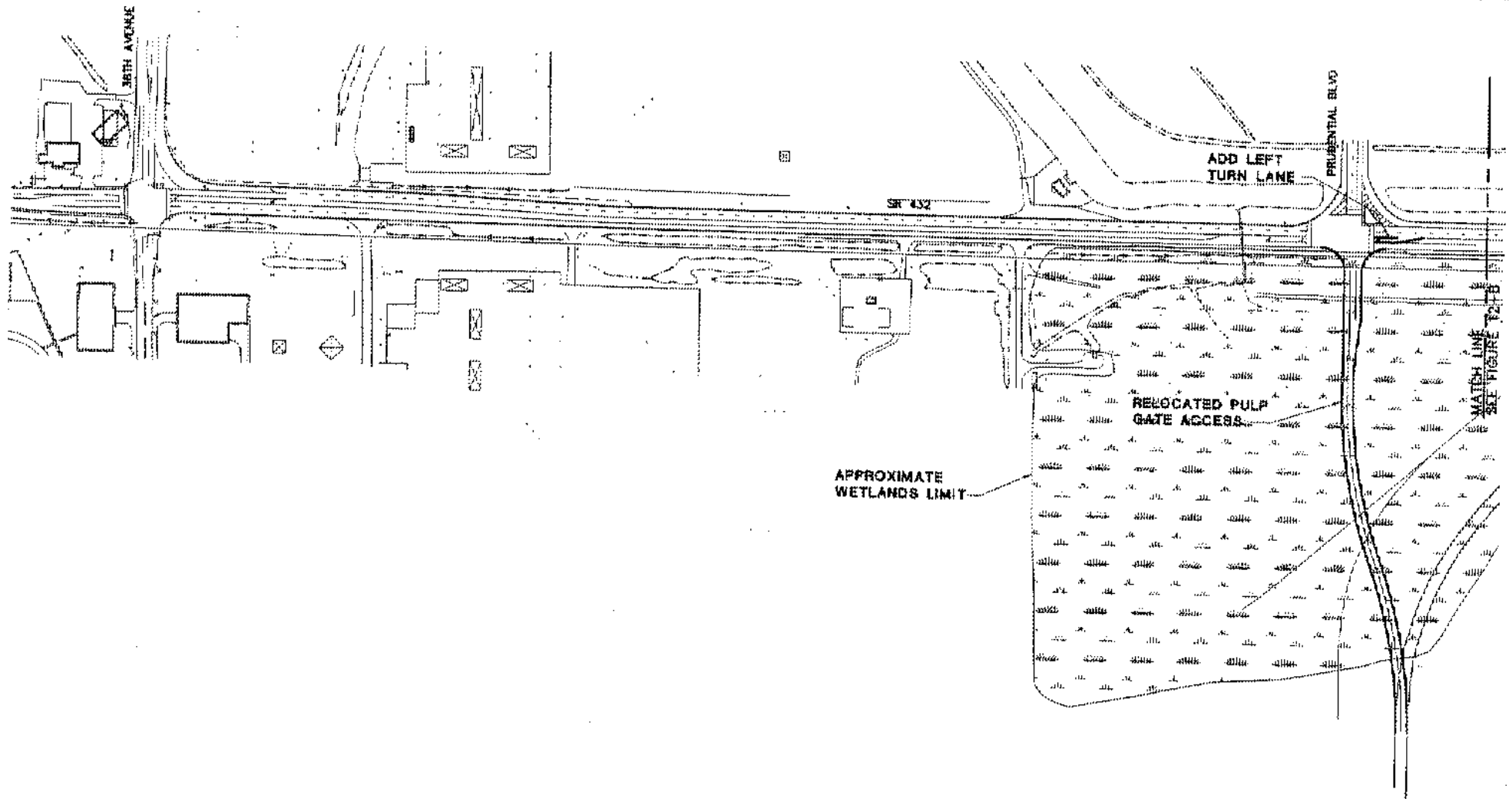
illustrated in Figure 13. Two-way left turn channelization improvements along Industrial Way between Oregon and Columbia Way are presented in Figure 14.

#### **Long-Term Improvement Alternatives**

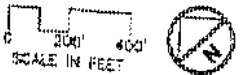
Following intensive discussions with local agencies, WSDOT and the public about the range of preliminary improvement alternatives for addressing identified system deficiencies in Segment 3, four alternatives were identified for further refinement in the central portion of the SR-432 corridor. These alternatives are illustrated in Figure 15 and include the following:

- **Alternative 1 - Industrial Way Extension** (3<sup>rd</sup> Avenue to Tennant Way) - Improve Industrial Way (left turn channelization throughout) and extend and widen this street eastward from 3<sup>rd</sup> Avenue to a new interchange with Tennant Way providing directional access to eastbound Tennant Way and from westbound Tennant Way. This may be done in combination with a full or partial widening west of Oregon Way.

Two improvement options were considered at the intersection of Oregon Way with Industrial Way. The first included improvements to the existing at-grade configuration of this intersection including addition of turning lanes for selected movements. The second concept included a grade-separation of Oregon Way passing over Industrial Way with a full interchange configuration. Concerns were raised by the public and local agencies over the impact of this alternative on local traffic circulation on East Industrial Way east of 3<sup>rd</sup> Avenue and the potential conflict between this traffic and the movement of vehicles to/from Tennant Way.

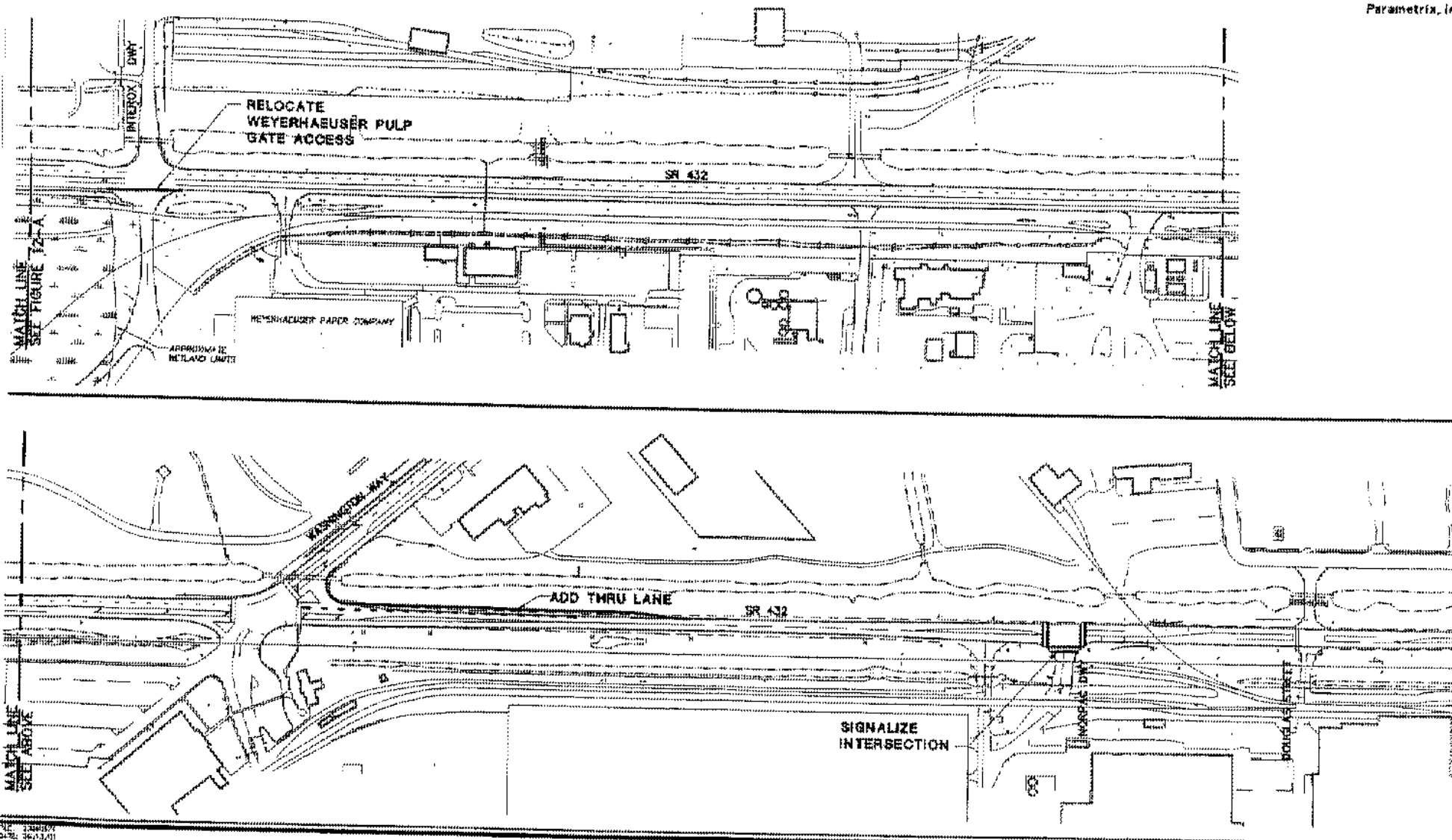


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**Figure 12-A**  
**Roadway Improvements 38th Street**  
**to Douglas Street, West End**  
SR432 ROUTE  
DEVELOPMENT PLAN





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BY: 56/13/07

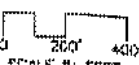
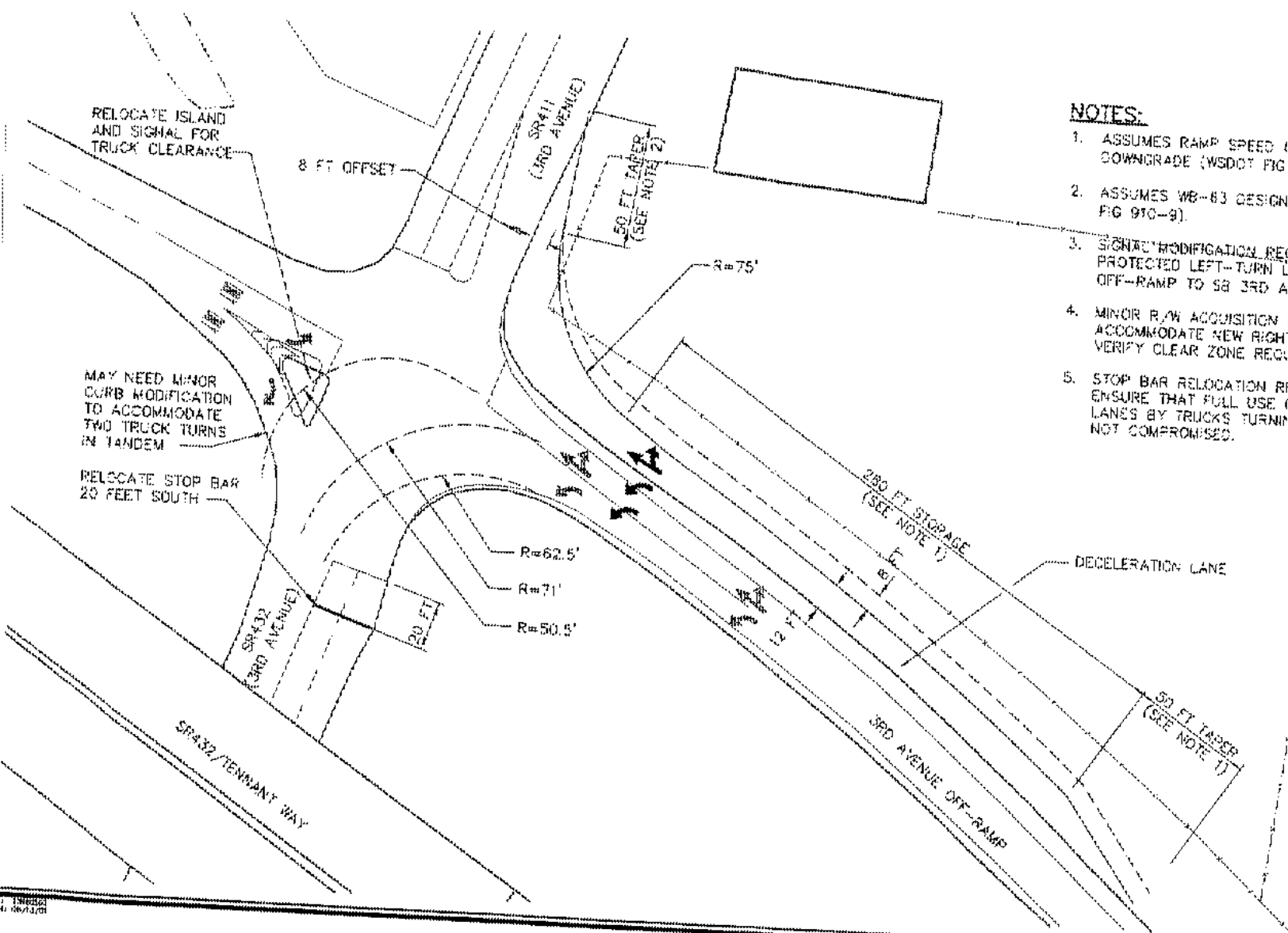


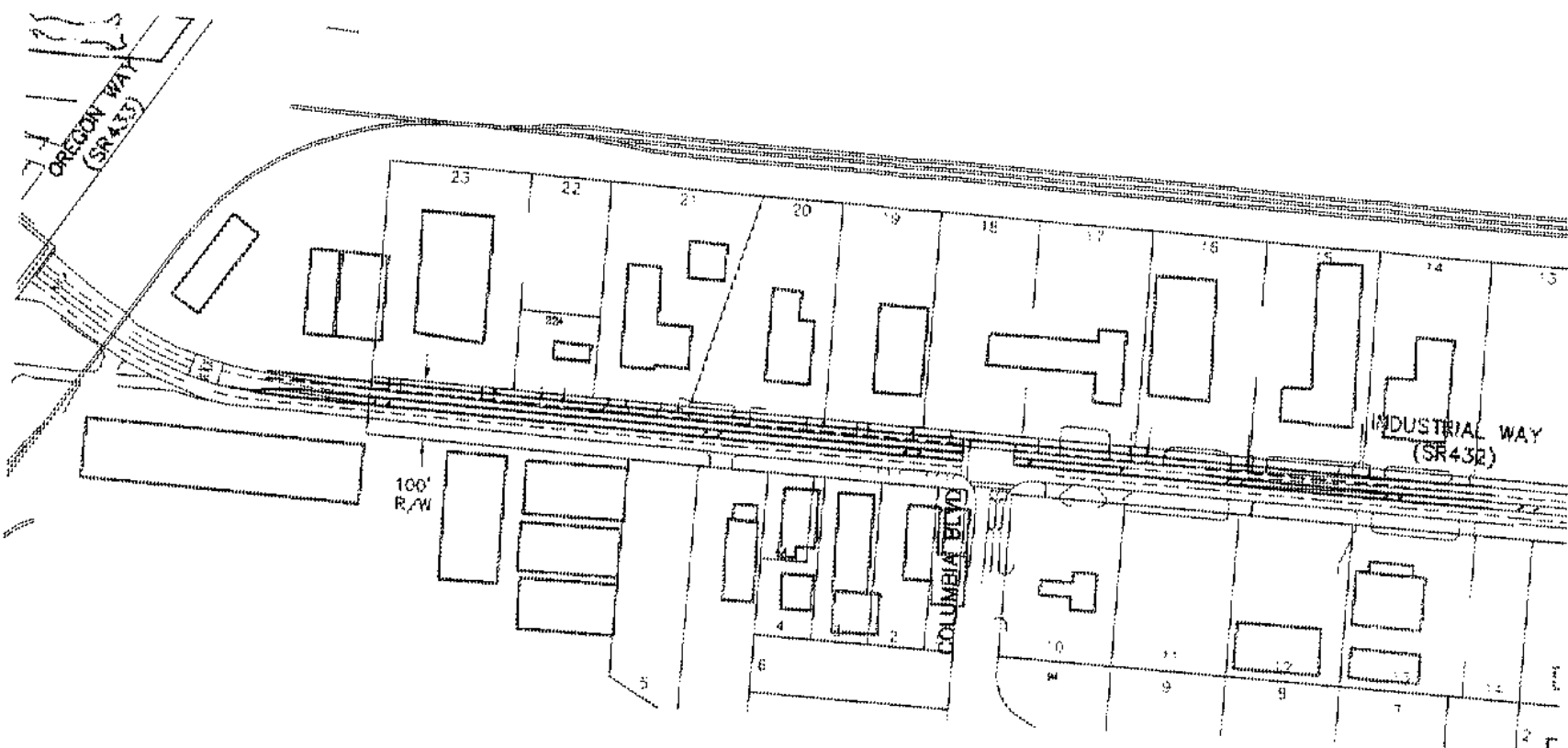
Figure 12-B  
Roadway Improvements 38th Street  
to Douglas Street, East End  
SR432 ROUTE  
DEVELOPMENT PLAN



# **NOTES:**

1. ASSUMES RAMP SPEED OF 35 MPH AND 3% DOWNGRADE (WSDOT FIG 910-11B).
2. ASSUMES WB-63 DESIGN VEHICLE (WSDOT FIG 910-9).
3. SIGNAGE MODIFICATION REQUIRED FOR DUAL PROTECTED LEFT-TURN LANES FROM OFF-RAMP TO SB 3RD AVENUE (SR 432).
4. MINOR R/W ACQUISITION REQUIRED TO ACCOMMODATE NEW RIGHT-TURN LANE; VERIFY CLEAR ZONE REQUIREMENTS.
5. STOP BAR RELOCATION RECOMMENDED TO ENSURE THAT FULL USE OF BOTH TURNING LANES BY TRUCKS TURNING IN TANDEM IS NOT COMPROMISED.

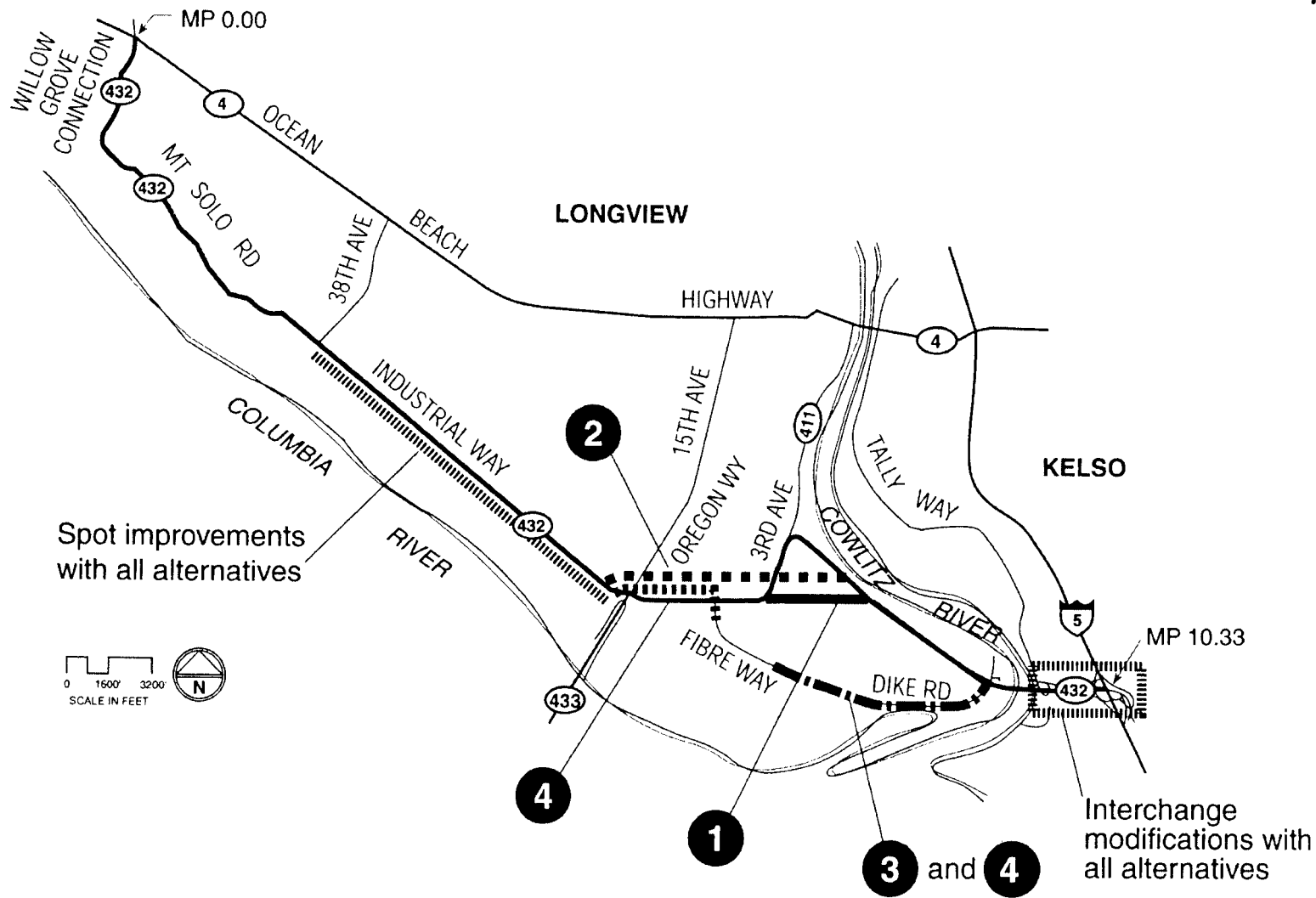
**Figure 13**  
**Westbound Left Turn Lane**  
**at 3rd Avenue Off Ramp**  
 SR 432 ROUTE  
 DEVELOPMENT PLAN



# NOTES:

1. ASSUMES TWO-WAY LEFT TURN LANE BETWEEN COLUMBIA BOULEVARD AND INTERNATIONAL WAY OR LEFT TURN POCKET AT COLUMBIA BOULEVARD IS CONSTRUCTED. LEFT TURN POCKET SHOWN.
2. WIDENING SHOWN NORTH SIDE ONLY TO MINIMIZE UTILITY RELOCATIONS.
3. DRIVEWAY CONSOLIDATION AND ACCESS MANAGEMENT RECOMMENDATIONS NOT SHOWN.
4. SIGNAL MODIFICATION REQUIRED AT INDUSTRIAL WAY/COLUMBIA BOULEVARD.

**Figure 14**  
**Two-Way Left Turn on Industrial Way**  
**Between Oregon Way and Columbia Blvd.**  
 SR432 ROUTE  
 DEVELOPMENT PLAN



Alternative 1 - Industrial Way Extension  
Alternative 3 - Fibre Way Extension

Alternative 2 - Industrial Way Bypass  
Alternative 4 - Bypass with Fibre Way Extension

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**Figure 15**  
**Segment 2 Improvement Alternatives**  
SR 432 ROUTE  
DEVELOPMENT PLAN

- **Alternative 2 – Industrial Way Bypass** (west of Oregon Way to Tennant Way) - Develop an Industrial Way Bypass along the drainage ditch north of and parallel to Industrial Way. This alternative may or may not include an extension easterly to a new interchange with Tennant Way where directional access to/from Tennant way to the east could be provided. This alternative could be paired with an extension of Fibre Way to Dike Road and/or full or partial widening of Industrial Way to the west of Oregon Way.

This alternative also included two options for improvement at the intersection of Oregon Way with Industrial Way and/or the Bypass. The first option involved improvement to the existing at-grade intersection of Oregon Way with Industrial Way plus the addition of an at-grade intersection between Oregon Way and the Bypass. Concern was expressed about maintaining an at-grade connection at both 3<sup>rd</sup> Avenue and California Way, particularly if the bypass is intended to serve through traffic and not local traffic destined for Industrial Way between 3<sup>rd</sup> Avenue and Oregon Way. A key issue with the Bypass Alternative will be relocation of either the adjacent drainage ditch or the Port Lead track. The ditch serves both volume and conveyance functions which necessitates finding a new location for the volume of stormwater detention that would be displaced by the Bypass. Rail relocation would involve modifications to the Longview Wye Switching Yard and may impact the Alternate Rail Corridor.

- **Alternative 3 – Fibre Way Extension** (from the end of the existing Fibre Way south of Industrial Way to the Dike Road

Interchange with SR-432) - Extend Fibre Way (including a variety of connections to Industrial Way) to connect with the Dike Road interchange. Interchange modifications would be necessary at Dike Road to improve the connection to Tennant Way. Variations on these options could also be paired with full or partial widening of Industrial west of Oregon Way.

This alternative also included options for improvement at the intersection of Oregon Way with Industrial Way and reconstruction of the SR-432/Dike Road interchange. Concern was expressed about the low level of traffic expected to use this facility and its appropriateness as a state highway. Roadway width would be constrained to a 2-lane cross-section of the new Fibre Way overcrossing of the Alternate Rail Corridor that will shortly be under construction. Additionally, the expense involved in reconstruction of the Dike Road interchange with SR-432 is likely to be high. The Fibre Way corridor also has the potential for significant natural resource impacts including wetlands, shorelines, and the need for a new waterway crossing.

- **Alternative 4 – Industrial Way Bypass and Fibre Way Extension Combination** including the Bypass from west of Oregon Way to a Fibre Way connector between the Bypass and Industrial Way, and extension of Fibre Way to the Dike Road interchange. This alternative also includes improvement to the Oregon Way/Industrial Way/Bypass intersections. This alternative would experience most of the impacts identified under Alternatives 2 and 3.

Table 20 summarizes the relative benefits and impacts of the four alternatives considered for Segment 3. Some of the issues that were considered when reviewing these alternatives included proximity to rail lines, potential impacts on stormwater drainage should the existing drainage facility require culverting or relocation to accommodate a four-lane bypass, and impacts to business operations on both sides of the existing segments of Industrial Way or Fibre Way. With the Fibre Way extension, one of the options for connection to Industrial Way would involve an extension of 3<sup>rd</sup> Avenue southward to intercept Fibre Way. Concern was raised with this option about cutting off Pacific Fibre trucks from their operations area.

Along East Industrial Way, concern was raised with the Industrial Way extension about increased levels of congestion caused by trucks queuing as they enter businesses in the extension segment. It is estimated 150 – 200 trucks are currently entering Pacific Fibre each day, with a total of 600 trucks using East Industrial Way on a peak day. That is in addition to the approximate 300 employees of Pacific Fibre and Weyerhaeuser that must also access the area. Concern was expressed about impacts of the Industrial Way Bypass option east of 3<sup>rd</sup> Avenue on existing log hauling operations. Development of the connection to Tennant Way needs to consider this activity.

Additionally, the Port of Longview expressed concern about feasibility of the possible continuation of Fibre Way along its northwesterly orientation through Port and other industrial property to intersect Industrial Way west of Oregon Way. This new roadway segment would pass through the area identified for significant rail improvements (the Alternate Rail Corridor). These rail improvements were being

developed to reduce the impact of rail on SR-432. Moving the highway south would reintroduce the rail/traffic conflict that the rail improvements were designed to resolve.

### Long-Term Improvement Recommendations

Based on the information in Table 20 and in conjunction with local agency and public input, Alternative 2 – the Industrial Way Bypass was chosen as the recommended alternative for the central portion of the SR-432 corridor. Alternative 2 was selected as the recommended improvement alternative for the central portion of the SR-432 corridor for the following reasons:

1. In comparison with other alternatives, this alternative would offer superior performance in separating local from through traffic within the most congested portion of the corridor.
2. The Bypass would attract a significant volume of traffic away from other east-west travel corridors including Industrial Way, Nichols Boulevard, and, to a lesser degree, from SR-4/Ocean Highway. The alternative helped to relieve projected congestion along Industrial Way and at the intersection of the Tennant Way ramps with 3<sup>rd</sup> Avenue. It would also reduce projected traffic volumes along Nichols Boulevard.
3. The Bypass would improve directness of access between the SR-432 corridor and I-5, reducing travel time for many major industries along the corridor, the Port of Longview and traffic from Oregon.
4. In comparison with other alternatives, the Bypass Alternative would minimize adverse impacts on adjacent businesses and nearby residential areas.

**Table 20**  
**Comparison of Segment 2 Improvement Alternatives (Oregon to Tennant Way)**

Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Property Impacts	<ul style="list-style-type: none"> <li>Potentially displaces some businesses and residences</li> <li>Likely right-of-way acquisition along Industrial east of 3rd</li> </ul>	<ul style="list-style-type: none"> <li>Potentially displaces some businesses and residences</li> <li>Requires property acquisition to relocate ditch north of existing ditch</li> </ul>	<ul style="list-style-type: none"> <li><b>Requires a lot of land acquisition but little or no displacement impacts</b></li> </ul>	<ul style="list-style-type: none"> <li>Requires acquisition of 1/3 Bypass right-of-way plus Fibre Way right-of-way</li> </ul>
Property Access	<ul style="list-style-type: none"> <li>Lots of driveway consolidation</li> <li>Likely to be a barrier median on Industrial Way</li> </ul>	<ul style="list-style-type: none"> <li><b>Maintains existing Industrial Way</b></li> </ul>	<ul style="list-style-type: none"> <li>Some driveway consolidation</li> <li>Likely to be a barrier median on Industrial Way</li> </ul>	<ul style="list-style-type: none"> <li>Some driveway consolidation</li> <li>Likely to be a barrier median on Industrial Way</li> </ul>
Traffic Flow	<ul style="list-style-type: none"> <li>Does not resolve conflict between local and through traffic</li> </ul>	<ul style="list-style-type: none"> <li><b>Separates local and through traffic</b></li> <li><b>Meets State Highway objectives</b></li> </ul>	<ul style="list-style-type: none"> <li>Does not resolve conflict between local and through traffic</li> <li>Does not meet State Highway objectives</li> </ul>	<ul style="list-style-type: none"> <li>Partially resolves conflict between local and through traffic</li> <li>Does not meet State Highway objectives</li> </ul>
Traffic Volume	<ul style="list-style-type: none"> <li>Increases traffic on Industrial Way east of Oregon (+60%)</li> <li>Significantly increases traffic on Industrial Way east of 3rd (+250%)</li> <li>Increases traffic on Industrial Way west of 3rd (+40%)</li> <li>Decreases traffic volumes at Tennant Way west off-ramp to 3rd Avenue (-80%)</li> </ul>	<ul style="list-style-type: none"> <li><b>Best accommodates projected traffic in the corridor</b></li> <li><b>Decreases traffic on Industrial Way east of Oregon Way (-40%)</b></li> <li><b>Decreases traffic on Tennant Way west off-ramp to 3rd Avenue (-80%)</b></li> </ul>	<ul style="list-style-type: none"> <li>Adds traffic to Industrial Way east of Oregon Way (+35%)</li> <li>Less relief of Tennant Way and 3rd Avenue interchange (-30%)</li> <li>Would carry 1/2 to 1/3 of the volume of the Bypass</li> </ul>	<ul style="list-style-type: none"> <li>Some relief to Industrial Way east of Oregon Way (-35%)</li> <li>Less relief of Tennant Way and 3rd interchange (-25%)</li> <li>Would carry 1/2 to 1/3 of the volume of the Bypass</li> </ul>
Environmental	<ul style="list-style-type: none"> <li><b>Minimal</b></li> </ul>	<ul style="list-style-type: none"> <li>Ditch is a low value jurisdictional wetland that will require mitigation if taken</li> <li>Project may require water quality mitigation</li> </ul>	<ul style="list-style-type: none"> <li>Significant wetland impacts</li> <li>Project may require water quality mitigation</li> <li>Likely floodplain impacts</li> </ul>	<ul style="list-style-type: none"> <li>Ditch is low value jurisdictional wetland and the portion relocated for this alternative will require mitigation</li> <li>Project may require water quality mitigation</li> <li>Likely floodplain impacts</li> </ul>
Rail Conflicts with State Highway (total of 3 existing today in middle area)	<ul style="list-style-type: none"> <li>Resolves 1 conflict</li> </ul>	<ul style="list-style-type: none"> <li><b>Resolves all 3 conflicts</b></li> </ul>	<ul style="list-style-type: none"> <li>Resolves 1 conflict</li> </ul>	<ul style="list-style-type: none"> <li><b>Resolves all 3 conflicts</b></li> </ul>
Cost - At-grade (1) - Interchange (1) - Dike Rd I/C	<ul style="list-style-type: none"> <li>\$25-30 million</li> <li>\$35-40 million</li> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>\$70-80 million</li> <li>\$80-90 million</li> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> <li>N/A</li> <li><b>\$25-30 million</b></li> </ul>	<ul style="list-style-type: none"> <li>\$40-50 million</li> <li>\$50-60 million</li> <li>N/A</li> </ul>

(1) “At-grade” and “Interchange” refers to improvements that would be constructed at intersection of Oregon Way with Industrial Way except for Alternative 3 where the only interchange improvement would be at Dike Road

Note: Bold text indicates alternative for which relevant criteria are best satisfied.

5. The Bypass would reduce the exposure of state highway traffic to the existing at-grade railroad crossing locations in the corridor. Three existing grade crossing locations would no longer carry state highway traffic with this alternative.
6. Environmental issues are expected to be minimal with this alternative.
7. The alternative can be developed in phases as funding is available.

Further refinement of the Industrial Way Bypass Alternative was needed to determine the optimal types of connections that should be provided to/from the bypass from the existing street system (including connection to Industrial Way at the west end and Tennant Way on the east end, and whether to have direct connections to either 3<sup>rd</sup> Avenue and/or California Way), the optimal lane configuration of the bypass (including treatment of the two intersections along Oregon Way - Industrial Way and the Bypass), and an assessment of the options available with respect to rail facility modifications that might enhance the effectiveness or reduce the costs associated with the bypass.

#### Refinement of Lane Configurations and Connections with the Industrial Way Bypass

Numerous options were considered for design of the Industrial Way Bypass between Tennant Way and the reconnection with Industrial Way west of Oregon Way. These options included various connections to 3<sup>rd</sup> Avenue and/or California Way, connections to Oregon Way, number of travel lanes on the Bypass itself, and associated improvements on Industrial Way and/or 3<sup>rd</sup> Avenue. The evaluation of these

options and recommended improvements are discussed in the following pages.

#### 1. Connections To/From 3<sup>rd</sup> Avenue and California Way

Options that were considered for connection to 3<sup>rd</sup> Avenue and/or California Way included:

- *Full directional at-grade intersections at both street crossings* – this option would spread bypass-destined traffic out to multiple access locations, thus reducing demand at Oregon Way. Good traffic operations could be maintained along Industrial Way and 3<sup>rd</sup> Avenue and local circulation would be improved. However, signalization along 3<sup>rd</sup> Avenue would be more complex, street widening would be required to provide left turn channelization with associated right-of-way impacts, and functionally, the connection would be redundant with the 3<sup>rd</sup> Avenue/Tennant Way interchange. Additionally, there may be a potential conflict with the rail crossing of 3<sup>rd</sup> Avenue north of Industrial Way.
- *Grade-separated crossing of 3<sup>rd</sup> Avenue and California Way with ramps to/from the east* – this option would also reduce demand for the bypass at Oregon Way by spreading access out to more locations. Good traffic operations could be maintained, and a clearer functional separation can be made between through and local traffic. However, all of the negative impacts identified above would also be applicable, additional right-of-way would be required from the log storage yard north of the bypass to accommodate the ramps, and costs would be higher.



- *Grade-separated crossing of 3<sup>rd</sup> Avenue and California Way with no ramp connections* – this option would require less right-of-way than the preceding option in that 3<sup>rd</sup> Avenue would not require widening and no right-of-way would be needed for ramps. Signal coordination along Industrial Way would be simplified as traffic volumes are expected to drop. However, additional travel lanes and lane channelization would be required on Oregon Way, generally between Industrial Way and the Bypass, and no significant improvement would be made to local connectivity.

In consultation with local agencies and the public, the recommendation was made that the Industrial Way Bypass not be connected to either 3<sup>rd</sup> Avenue or California Way. This recommendation emphasizes the importance of the bypass as the new state highway, the intent of which is to provide for through traffic movement between the east and west ends of the SR-432 corridor, to I-5, to Oregon, and to other locations outside of the study area.

## 2. Connections at Oregon Way

Many options were developed and evaluated for connecting the Industrial Way Bypass to Oregon Way including:

- At-grade connections
- Grade-separated connections with Oregon Way passing over the Bypass
- Grade-separated connections with the Bypass crossing over Oregon Way
- Grade-separated Bypass with connections to Oregon Way aligned with Alabama Street
- Termination of the Bypass and/or Industrial Way at Oregon Way

Eleven options were initially developed as design concepts or line drawings and analysis was conducted of potential impacts on traffic flow, property access, potential displacements, right-of-way requirements, likely environmental issues, rail conflicts and magnitude of expected cost. These options were screened and further evaluation was conducted of four options as outlined in Table 21. These options included:

- *Option A: At-grade Connections to Oregon Way and Industrial Way* – Key advantages of this option were that all directional connections could be made between Oregon Way, the Bypass and Industrial Way, levels of service would be generally acceptable and there would be no railroad crossing west of Oregon Way for state highway traffic. The existing at-grade railroad crossing on Oregon Way between the Bypass and Industrial Way would remain and may impact traffic operations at both intersections, there may be some property access restrictions along Oregon Way and there may be traffic queuing problems on Oregon Way between the Bypass and Industrial Way due to the proximity of these two intersections. The cost would generally be the lowest of all options considered.

*Option B: Grade-separation with Oregon Way over Industrial Way and the Bypass* – With this option, intersection levels of service would generally be good and all directional connections could be made. However, because of limitations to interchange and adjacent Lewis and Clark bridge elevations, access to the Port of Longview from the bridge would be steeper than at present. Significant right-of-way impacts along Oregon Way would be experienced. Pedestrian accessibility would be diminished and costs would be high.

**Table 21**  
**Comparison of Industrial Way Bypass / Oregon Way Intersection Options**

<b>Evaluation Criteria</b>	<b>Option A—At-Grade Intersections</b>	<b>Option B—Oregon Over with Ramps at 3<sup>rd</sup></b>	<b>Option D-1—Bypass Over with No Ramps at 3<sup>rd</sup></b>	<b>Option I – Bypass Over with Partial Interchange</b>
Traffic Flow	<ul style="list-style-type: none"> <li>Inadequate storage between Industrial Way and Bypass</li> <li>Acceptable LOS</li> </ul>	<ul style="list-style-type: none"> <li>Acceptable LOS</li> <li>Connection from bridge to Oregon Way is free flow</li> <li>Connection to Bypass from all directions must pass through signals</li> </ul>	<ul style="list-style-type: none"> <li>Very good LOS</li> <li>Very long traffic queue for northbound right from Oregon to Bypass</li> <li>May trap confused drivers who can't get off until Dike Road</li> </ul>	<ul style="list-style-type: none"> <li>Very good LOS</li> <li>May have long traffic queue for northbound right turn from Oregon to Bypass</li> <li>May trap confused drivers who can't get off until Dike Road</li> </ul>
Property Access	<ul style="list-style-type: none"> <li>May be curtailed on Oregon between Bypass and Industrial</li> </ul>	<ul style="list-style-type: none"> <li>Steeper grade for Port access from L&amp;C bridge</li> <li>Significant restrictions on Oregon south of Beach</li> <li>May preclude Weyerhaeuser direct access to bridge</li> </ul>	<ul style="list-style-type: none"> <li>May be curtailed on Oregon between Bypass and Industrial</li> </ul>	<ul style="list-style-type: none"> <li>May be curtailed on Oregon between Bypass and Industrial</li> </ul>
Displacements	<ul style="list-style-type: none"> <li>Minor, possibly pump stations and businesses on Oregon between Industrial and Bypass</li> </ul>	<ul style="list-style-type: none"> <li>Likely residential and business displacements on Oregon south of Beach</li> <li>Maintaining Port access from bridge will require some industrial displacements east of Oregon</li> </ul>	<ul style="list-style-type: none"> <li>Minor, possibly pump station and businesses on Oregon between Industrial and Bypass</li> </ul>	<ul style="list-style-type: none"> <li>Minor, possibly pump station and businesses on Oregon between Industrial and Bypass</li> </ul>
Right-of-Way	<ul style="list-style-type: none"> <li>Largely confined to ditch and ditch relocation with some required along Oregon Way between Bypass and Industrial</li> </ul>	<ul style="list-style-type: none"> <li>Significant acquisition along both sides of Oregon south of Beach</li> </ul>	<ul style="list-style-type: none"> <li>Moderate impact, largely ditch and industrial area north of Bypass and east of Oregon</li> </ul>	<ul style="list-style-type: none"> <li>Moderate impact, largely ditch and industrial area north of Bypass and east of Oregon</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>Traffic noise impact on residential</li> <li>Water quality / wetlands impact on ditch</li> </ul>	<ul style="list-style-type: none"> <li>Same as Option A</li> </ul>	<ul style="list-style-type: none"> <li>Traffic noise impact on residential</li> <li>Potentially greater wetlands and water quality impacts</li> </ul>	<ul style="list-style-type: none"> <li>Traffic noise impact on residential</li> <li>Wetlands impacts similar to but slightly less than Option D-1</li> </ul>
Rail Conflicts	<ul style="list-style-type: none"> <li>All traffic must cross Reynolds lead on Oregon</li> </ul>	<ul style="list-style-type: none"> <li>No rail crossing for through traffic on Oregon</li> </ul>	<ul style="list-style-type: none"> <li>All traffic must cross Reynolds lead on Oregon</li> </ul>	<ul style="list-style-type: none"> <li>All traffic must cross Reynolds lead on Oregon</li> </ul>
Cost	<ul style="list-style-type: none"> <li>Lower</li> </ul>	<ul style="list-style-type: none"> <li>Higher</li> </ul>	<ul style="list-style-type: none"> <li>Mid-range</li> </ul>	<ul style="list-style-type: none"> <li>Mid-range</li> </ul>

- *Option D-1: Grade-separation with Bypass over Oregon Way, Industrial Way Intersection At-Grade* – This option would result in very good intersection levels of service, however there would likely be traffic queuing problems for vehicles on Oregon Way between the Bypass and Industrial Way. All directional connections would be maintained and right-of-way impacts would be moderate in comparison with Option B. The at-grade railroad crossing on Oregon Way would constrain interchange operations at the Bypass and a median on Oregon Way would be necessary to accommodate the railroad gates, adding to the width of that street. A greater impact on the adjacent drainage ditch would be experienced than with other options and pedestrian accessibility would be diminished. Costs would be mid-range.
- *Option I: Grade-separation with Bypass Over Oregon Way (Partial Interchange), Industrial Way Intersection At-Grade* – Impacts, advantages and disadvantages with this option would be similar to Option D-1 as described above and in Table 20 except for the following. Right-of-way impacts would be reduced due to lack of ramps to/from the west, costs would be less and traffic operational on the intersections of Oregon Way with the Bypass and Industrial Way would be slightly better.

### 3. Lane Channelization on Bypass

Options were considered for both two and four through travel lanes on the Bypass. Analysis was based on traffic demand, presence or absence of connections to other streets that would necessitate acceleration/deceleration or turning lanes,

local circulation impacts, safety, cost, and right-of-way impacts. Forecasts for 2017 PM peak hour traffic indicate that the maximum hourly volumes would range between 1,000 and 1,500 vehicles in the peak direction, dependent upon location and the option under consideration. This level of traffic can be effectively accommodated in a single directional travel lane.

### 4. Other Improvements to Facilitate Traffic Operations in Bypass Project Area

To further enhance traffic operations in the Industrial Way corridor in conjunction with the Bypass, some additional roadway improvements were considered. Generally, these improvements were evaluated and recommended to address specific access issues resulting from implementation of the bypass concept or to address short-term problems in advance of bypass construction. Typically, after completion of the bypass, these improvements would continue to enhance traffic circulation in the SR-432 corridor. Improvements included additional turn lane channelization at the intersection of Oregon Way with Industrial Way, and development of two-way left turn channelization on Industrial Way between Columbia Boulevard and Oregon Way.

### 5. Summary of Design Concept Recommendations for Industrial Way Bypass

Based on local agency and public input obtained during several TAC and stakeholders Advisory Committee meetings, a recommended configuration for the Industrial Way Bypass was determined. As conceived, this project would include:

- Single travel lane in each direction

- Connect to Tennant Way via a westbound off ramp and an eastbound on ramp
- No connection at 3<sup>rd</sup> Avenue and California Way
- Grade-separation at Oregon Way with ramps to and from the east only
- Signalized intersection where the Bypass joins Industrial Way west of Oregon Way with turn restrictions on west-to-eastbound traffic movement.
- Improvements to the intersection of Industrial Way at Oregon Way to add a westbound right turn lane
- Addition of a two-way left turn lane on Industrial Way between Columbia Boulevard and Oregon Way
- Relocation of existing Weyerhaeuser/Norpac driveway at SRMP 5.95 to west of the new intersection with the Bypass and Industrial Way to facilitate access to the bypass by traffic using this access location.
- The Bypass should include standard bicycle and pedestrian facilities.

#### 6. Recommendations for Existing Industrial Way

When the Industrial Way Bypass is constructed it should be designated as SR-432 and the existing portion of 3<sup>rd</sup> Avenue/Industrial Way between Tennant Way and just west of Oregon Way (where Industrial Way is joined by the Bypass) should revert to the appropriate local jurisdiction. Consideration should be given to adding sidewalks along this facility, to instituting access management strategies where and whenever possible, and implementing the other short-term improvement recommendations identified in this Route Development Plan (if not previously implemented).

Figures 16A, 16B, 16C and 16D illustrate the recommended Industrial Way Bypass concept.

#### **Segment 4 – SR-432 Between Tennant Way/3<sup>rd</sup> Avenue Vicinity and Cowlitz River Bridge**

There are no level of service deficiencies identified for this segment of the SR-432 corridor. This portion of SR-432 is designated as an Urban Freeway/Expressway, providing limited access and high speed service. Connections to and from this type of facility should only be at interchange facilities. There is an existing limited access, at grade intersection at SRMP.8.63 that serves Lakeside Industries and connects to a frontage road paralleling SR-432 along the north side. This frontage road also has alternative access to SR-432 via the Dike Road interchange to the east. As volumes on this section of SR-432 continue to increase, this intersection will likely become a greater operational and safety concern. Local roadway improvements that will lead to closure of this intersection should be pursued.

There is also an existing at-grade rail crossing in this segment of SR-432 at SRMP 8.54. This rail spur line connects the Cytac industrial site with the Longview switching yard and currently carries very low rail traffic volumes. As a part of the Industrial Way Bypass project, this grade crossing will be relocated further west to eliminate the rail/highway conflict for state highway traffic using the Industrial Way Bypass. Traffic continuing further west on Tennant Way toward 3<sup>rd</sup> Avenue would still need to cross this relocated trackway.

## **Segment 5 – Cowlitz River Bridge to I-5**

Based on analysis of existing design hourly traffic volumes, this segment of the SR-432 corridor includes the only currently deficient portion of the highway. This deficiency is located at the westbound weaving area between the I-5 southbound off-ramp to westbound SR-432, and the westbound SR-432 off-ramp to Talley Way. This weaving area is less than 600-feet in length and currently operates at LOS E. By 2017, this location and others in the segment will likely experience LOS E and/or F conditions during peak travel periods. Deficiencies in the 2017 baseline condition are as follows:

- SR-432/Talley Way westbound ramp termini intersection – Future LOS F is expected at this intersection for traffic exiting the off-ramp onto Talley Way. This ramp is currently sub-standard and traffic operations are complicated by the access road that intersects the ramp between the freeway gore point and the Talley Way intersection.
- SR-432, I-5 to Talley Way westbound - LOS F in the weaving area, LOS E in the non-weaving area
- SR-432, I-5 to Talley Way eastbound - LOS E in the weaving area, LOS F in the non-weaving area
- I-5 off-ramp at Old Highway 99 – LOS F for east and westbound traffic at the intersection, including traffic exiting I-5. There are some sight distance issues at this intersection that will be exacerbated by increasing traffic volumes and/or any potential signalization at this location.

Numerous alternatives were developed and analyzed to resolve the weaving and

intersection level of service problems. The alternatives studied included interchange ramp revisions, several new interchange concepts, removal of the Talley Way interchange coupled with revisions to the I-5/SR-432 interchange to accommodate Talley Way traffic, and modifications to the existing Talley Way and I-5 interchanges. These alternatives generally fell into one of three categories as described below:

- Improvements to existing weaving condition between interchanges through separation of traffic movements
- Closure of the Talley Way interchange and diversion of traffic via another route to/from I-5 thus eliminating the weaving area
- Modifications to the Talley Way and/or I-5 interchanges to improve geometrics and traffic operations at both locations.

These options are discussed in greater detail in Appendix E. Included is an analysis of traffic operations, engineering issues and potential environmental impacts associated with the various options, key findings and conclusions, and recommended future actions.

None of the alternatives studied was able to fully resolve the identified deficiencies and each had potential natural resource, right-of-way, or highway geometric impacts associated with it that made it unacceptable solution from a state and/or local perspective. A major constraint to improvements in this area is the design of the I-5/SR-432 interchange itself. It is anticipated that any final solution to the problems at the eastern end of SR-432 must include consideration of interchange modifications that may affect existing access to/from I-5.

LEGEND

SHADDED AREA IS A STRUCTURE

Parametrix, Inc.

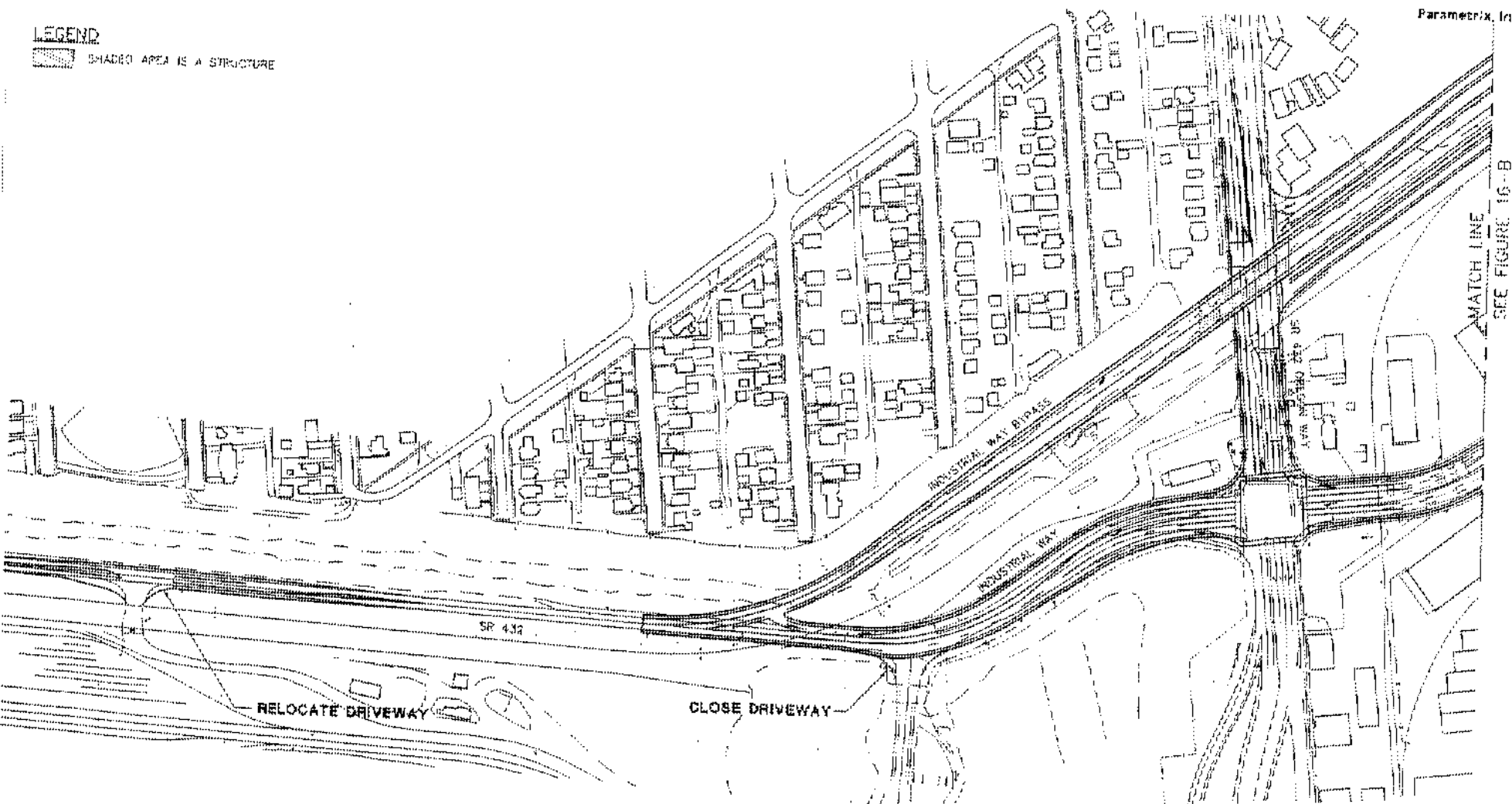


Figure 16-A  
Industrial Way Bypass  
Concept  
SR 432 ROUTE  
DEVELOPMENT PLAN

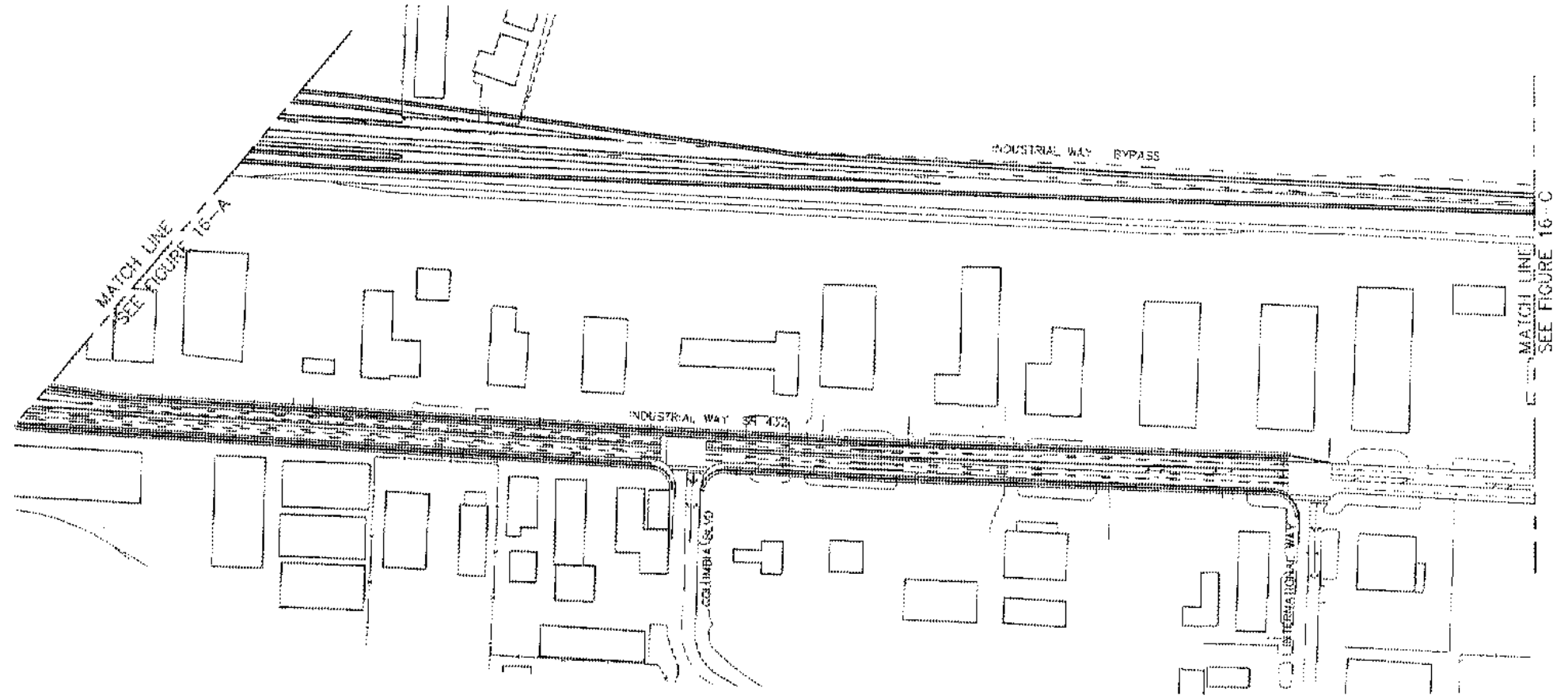


Figure 16-B  
Industrial Way Bypass  
Concept  
SR 432 ROUTE  
DEVELOPMENT PLAN

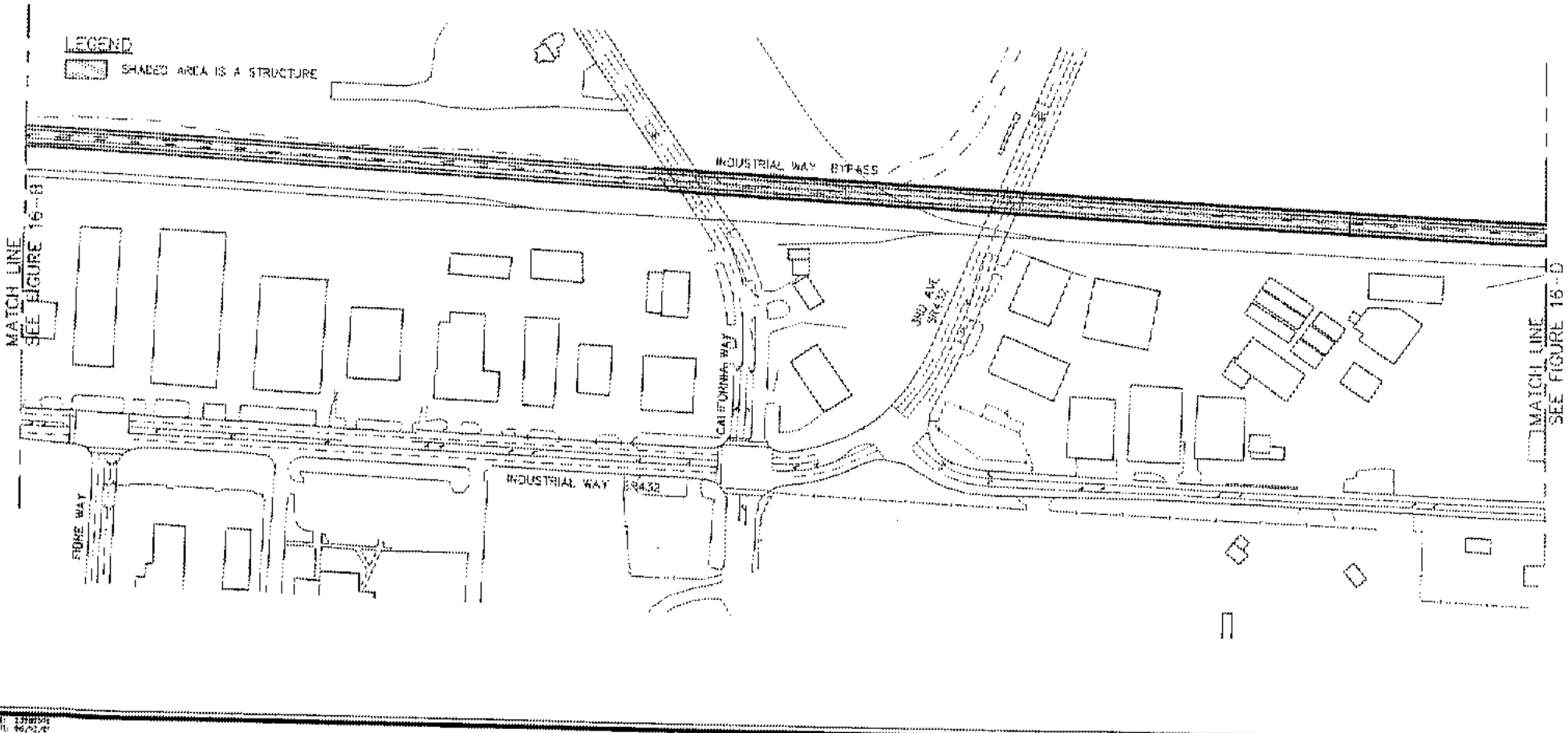


Figure 16-C  
Industrial Way Bypass  
Concept  
SR 432 ROUTE  
DEVELOPMENT PLAN



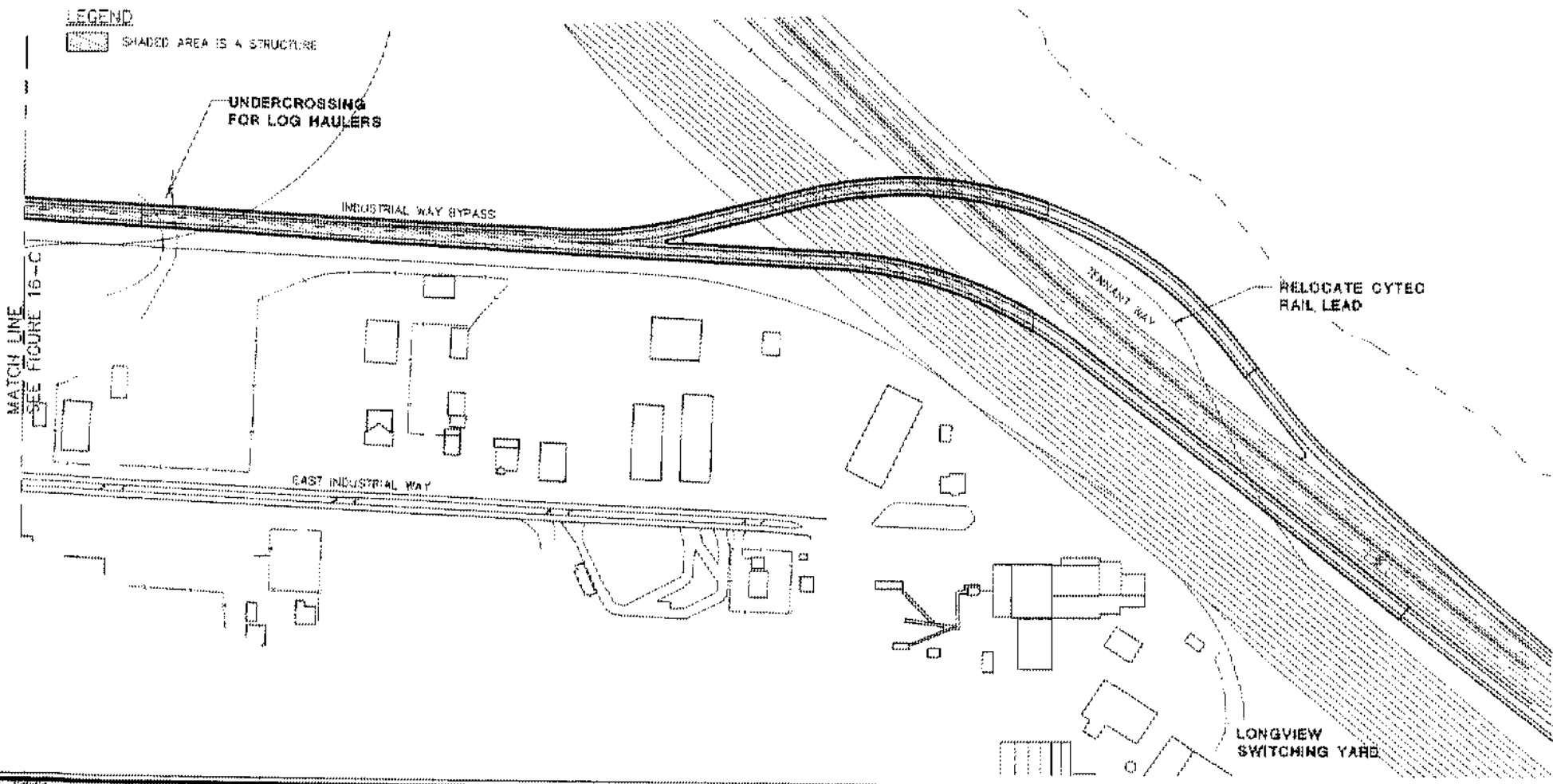
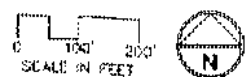


Figure 16-D  
 Industrial Way Bypass  
 Concept  
 SR 402 ROUTE  
 DEVELOPMENT PLAN



With the completion of the SR-432 Route Development Plan, a decision was made by the local Technical and Stakeholder Advisory Committees to further evaluate the I-5/SR-432 interchange through preparation of an Added Access Decision Report. Objectives of this analysis would include:

- Resolution of the existing and projected operational deficiencies to reduce delays and vehicular conflicts along SR-432 between the Cowlitz River and I-5, and at the SR-432/I-5 interchange.
- Resolution of deficient roadway geometrics at and near the I-5/SR-432 interchange.
- Reduction of negative impacts associated with delays to freight movement between I-5 and the Longview and Kelso industrial corridors consistent with planned or recommended local improvements.

### ***Rail System Improvement Options***

As noted in the discussion of existing rail facilities and service in Chapter 3, the Longview Switching Company (LSC) Railroad borders most of the SR-432 corridor. This railroad is jointly owned by UPRR and BNSF and is operated by agreement as a non-profit railroad by BNSF. The LSC receives cars from and deliver cars to Longview Junction (to the east), to Longview Fibre (along the Fibre Lead), to the Port of Longview (along the Port Lead) and to Reynolds Aluminum (along the Reynolds Lead Track that is an extension of the Port Lead). Additionally, the Columbia & Cowlitz Railroad provides service in the corridor, crossing SR-432 east of Washington Way. The Columbia & Cowlitz Railroad is a Class 3 railroad that is a wholly owned subsidiary of Weyerhaeuser. This railroad handles rail

freight for Weyerhaeuser, as well as the newly sited industry located in the Mint Farm. This business is routed along the Columbia & Cowlitz Railroad's mainline, which rings the Cities of Longview and Kelso and accesses the BNSF mainline at Rocky Point to the north.

As also discussed in Chapter 3, the Port of Longview's Alternate Rail Corridor (ARC) is presently under construction. The ARC diverges from the LSC's Fibre Lead east of the LSC yard office. This corridor is intended to allow unit train movements to move between the BNSF mainline and the Port without blocking the at-grade highway crossings at 3<sup>rd</sup> Avenue, California Way and Oregon Way.

Because of the significance of rail-related safety and congestion/delay impacts on SR-432, one of the objectives of the RDP has been to development recommended improvements to minimize or reduce these impacts. Additionally, with selection of the Industrial Way Bypass as the recommended alternative, potential relocation of the Port Lead track between the Longview Switching Yard and the Port should be considered as a mean of providing the necessary right-of-way for this highway improvement between approximately 3<sup>d</sup> Avenue and Oregon Way. Relocation of the rail line may eliminate the need to relocate drainage Ditch Number 3, and its associated costs and right-of-way impacts, in order to provide sufficient space for the new road.

Two primary rail system options were considered to minimize rail and highway conflicts in the SR-432 corridor.

1. The first option is essentially a "Do-Nothing" or No Build option where no changes to existing rail trackway and operations would be implemented. This

option would do nothing to minimize existing rail/highway conflicts along Industrial Way both east and west of Oregon Way, on Oregon Way north of Industrial Way, and on California Way and 3<sup>rd</sup> Avenue north of Industrial Way affecting traffic operations and roadway safety. However, through construction of the Bypass and its subsequent designation as SR-432, state highway-related traffic would be largely removed from these conflicts. Local street improvements could be made to these crossing locations to enhance safety.

2. The second option involves moving the existing Port Lead track between the Longview Switching Yard and Oregon Way to the Alternate Rail Corridor (ARC). The ARC is being built with two tracks and space for a third under the future Fibre Way overcrossing. This option would require modifications to the Longview Switching Yard and would need to connect to the Reynolds Lead track via a crossing of Oregon Way south of Industrial Way. While Union Pacific railroad representatives indicated that the Reynolds Lead currently carries short trains (5 to 10 cars in length) and normally occupies the crossing for a very short and infrequent period of time, this pattern could change if traffic presently using the Cowlitz and Columbia Railroad shifts to the Reynolds Lead. Rail traffic that could potentially shift could include that destined for Weyerhaeuser, Prudential Steel, Interlox and other, possible future, users. In the event that this shift in rail traffic should occur, the location where the Reynolds Lead crosses Oregon Way may require grade-separation of rail traffic from vehicular traffic destined to/from the Lewis and

Clark Bridge. This grade separation could require further modifications to the proposed Bypass/Oregon Way interchange.

Changes in the Longview Switching Yard (LSC) that would be necessary with a shift of the Port Lead to the ARC could include:

- Building a wye connection at the south end of the LSC Yard and relocating 11,400 rail feet of track, possibly along the ARC.
- Keeping existing shove access to ARC and adding two tracks on the northeast side of yard to replace lost storage along Port Lead.
- Aligning the northern end of LSC Yard to parallel the Port Lead, eliminating the wye, but avoiding having the bridge piers for the connection between the Bypass and Tennant Way in the yard.

Table 22 outlines these two rail modification options and identifies potential impacts on rail and highway operations and connectivity.

The various features of the Industrial Way Bypass concept were reviewed with Union Pacific (UP) and Burlington Northern/Santa Fe (BNSF) staff to identify issues, concerns and comments.

Comments from both UPRR and BNSF about the design concepts and the option for relocation of the Port Lead to the ARC were similar in the following areas:

**Table 22**  
**Options for Railroad Modification**

<b>Modification</b>	<b>Impact on Highway</b>	<b>Impact on Rail</b>
No change to existing rail track alignment	<ul style="list-style-type: none"> <li>• With designation of the Bypass as SR-432, existing railroad tracks would not cross the state highway at-grade. At-grade crossings would still remain along local streets.</li> </ul>	<ul style="list-style-type: none"> <li>• No change in rail operations, safety issue with existing roadway crossings would remain.</li> </ul>
Move Port lead south to use Alternate Rail Corridor	<ul style="list-style-type: none"> <li>• Eliminates existing railroad crossings on 3<sup>rd</sup> Avenue, California Way, Industrial Way and Oregon Way.</li> <li>• Would require crossing of Oregon Way south of Industrial for Reynolds lead and may require grade-separation at this location impacting the recommended interchange at Oregon Way/Bypass.</li> <li>• Does not affect Columbia &amp; Cowlitz crossing near Washington Way that serves Weyerhaeuser</li> <li>• Would require grade-separation at south end of this intersection.</li> <li>• May impact layout of Bypass in relation to Industrial Way intersection at Oregon.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires replacement of existing train storage north of Industrial Way between California and Oregon Way.</li> <li>• Requires out-of-direction train switching operations in rail yard to access ARC. Tracks in rail yard that serve the Port and others exit rail yard at north end. ARC will exit near south end.</li> <li>• May be acceptable to railroads but requires further study.</li> </ul>

1. Both railroads noted that the 200' to 400' spans of the overpass connecting Tennant Way to the Bypass (east of 3<sup>rd</sup> Avenue) would require a pier or piers to be placed in the middle of the long LSC yard tracks. While neither railroad thought that this would be objectionable, they both thought that the following would have to occur in order to be made whole:

- The footage of the track northwest of the pier(s) would have to be installed elsewhere at a relatively convenient location for the railroad's use.

- It is likely that a temporary road crossing would be necessary to access the area of pier construction. If it was necessary to keep this crossing clear and to keep the tracks on either side of the pier clear during the construction phase, then this too would constitute a disruption to the railroad and they would have to be made whole.

- Both UP & BNSF felt the wye track would remain a necessity.
- Both BNSF & UP said that the ultimate usage of the industrial tracks

in the vicinity of 3<sup>rd</sup> Avenue and California Way would be determined by BNSF operating personnel.

2. Neither UPRR or BNSF wanted an at-grade highway crossing that would result from a northward extension of Fibre Way from the existing intersection with Industrial Way to a proposed intersection with a future Industrial Bypass that would be located north of the Port Lead (this was one of many concepts considered in the development of the Industrial Way Bypass Alternative). This was due to the fact that LSC used this section of the Port Lead to hold and store freight cars.
3. The various designs offered for the Oregon Way/ Industrial Way/Industrial Bypass all seemed acceptable to the railroads (except for the short-term option that simply improved the existing Oregon Way/ Industrial Way intersection).
4. The railroads differed slightly in their initial reaction to the idea of completely relocating the functions of the Port Lead to the Port's Alternative Rail Corridor (ARC). Union Pacific thought that the added switching moves necessary to build a train enroute to the ARC could possibly congest the east yard lead. It was noted that the ARC was built to handle unit trains to and from the BNSF mainline and that the ARC was not constructed to handle trains entering or leaving the LSC yard. For this reason, they were initially opposed further consideration of this concept.

BNSF has indicated that they would strongly prefer to have all alternatives displayed in a presentation booklet or report that could be circulated internally. In this manner, all departments could review the ramifications of the various

alternatives and thereby reach a consensus. One possibility might be to expand the ARC to completely handle the functionality of the Port Lead, including some method of coupling the LSC to the ARC.

## **SUMMARY OF RECOMMENDED IMPROVEMENTS**

In presenting the summary of improvement recommendations for the entire SR-432 corridor, the corridor was divided into five segments from west to east as follows:

- SR-4 to 38<sup>th</sup> Avenue,
- 38<sup>th</sup> Avenue to west of Oregon Way;
- West of Oregon Way to Tennant Way;
- Tennant Way - 3<sup>rd</sup> Avenue to Cowlitz River; and
- Tennant Way - Cowlitz River to I-5.

Improvement recommendations in each of these segments are discussed in the following paragraphs. Roadway and intersection traffic volumes are shown in Figure 17. Levels of service for 2017 PM peak hour conditions with these improvements in place are presented in Tables 23 and 24, respectively.

### **Segment 1 - SR-4 to 38<sup>th</sup> Avenue**

Analysis of existing and 2017 baseline PM peak hour intersection and roadway levels of service identified no deficiencies in this section. Accordingly, no improvements are proposed.

In conjunction with the recommended Industrial Way Bypass in the central portion of the corridor, some increase in 2017 PM peak hour traffic volumes is anticipated in this segment which would reduce roadway

# INTERSECTION LEGEND

- |   |  |
|---|--|
| ① SR-432 / SR-4                             | ⑬ SR-432 / COLUMBIA BLVD                           |
| ② SR-432 / MT. SOLI ROAD                    | ⑭ SR-432 / INTERNATIONAL WAY                       |
| ③ SR-432 / MEMORIAL PARK DRIVE              | ⑮ SR-432 / PINE WAY                                |
| ④ SR-432 / 38TH AVENUE                      | ⑯ SR-432 / CALIFORNIA WAY                          |
| ⑤ SR-432 / PRUDENTIAL BLVD.                 | ⑰ SR-432 / EAST INDUSTRIAL WAY                     |
| ⑥ SR-432 / WEYERHAEUSER PULP CATE           | ⑱ SR-432 / TENNANT WAY - EB OFF RAMP TO 3RD AVENUE |
| ⑦ SR-432 / WASHINGTON WAY                   | ⑲ SR-432 / TENNANT WAY - WB OFF RAMP TO 3RD AVENUE |
| ⑧ SR-432 / WEYERHAEUSER-NORPAC (SR MP 4.72) | ⑳ INDUSTRIAL WAY/ BYPASS                           |
| ⑨ SR-432 / DOUGLAS STREET                   | ㉑ OREGON WAY/ BYPASS                               |
| ⑩ SR-432 / WEYERHAEUSER-NORPAC (SR MP 5.95) |  |
| ⑪ SR-432 / OREGON WAY                       |  |

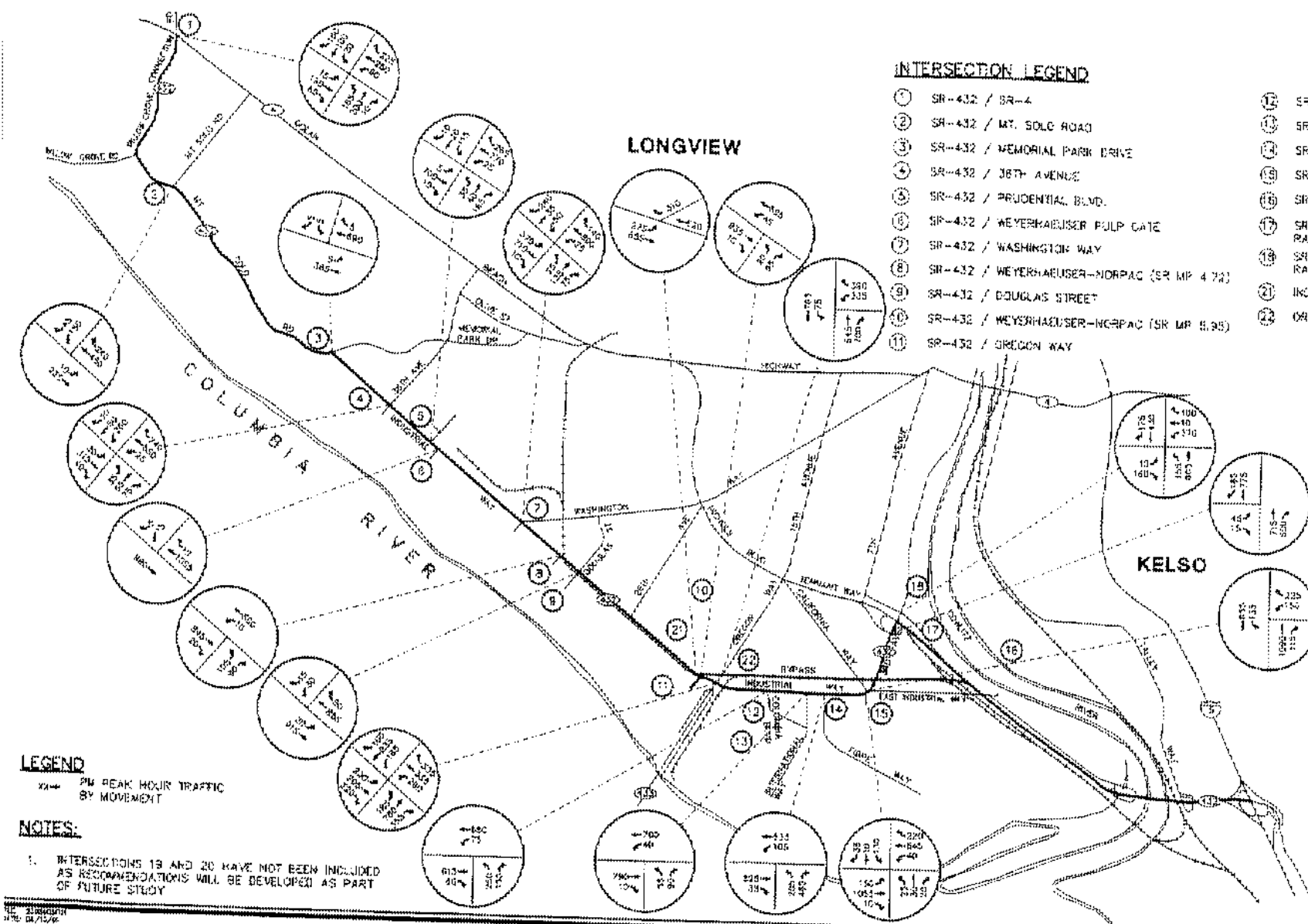


Figure 17  
 2017 PM Peak Hour Traffic Volumes  
 With Recommended Improvements  
 SR432 ROUTE  
 DEVELOPMENT PLAN

**Table 23**  
**2017 Highway Segment Levels of Service with Recommended Improvements**

Segment Description	Type	PM Peak Hour Volume		Speed (MPH)		LOS	
		EB	WB	EB	WB	EB	WB
SR-4 to 38 <sup>th</sup> Avenue (SRMP 0.00 - 3.33)	2 lane	390	695	--	--	D	D/E
38 <sup>th</sup> Avenue to Prudential Blvd. (SRMP 3.33 - 3.84)	Arterial	730	815	29	23	B	C
Prudential Blvd. to Washington Way (SRMP 3.84 - 4.43)	Arterial	1,095	1,065	36	40	A	A
Washington Way to Norpac (SRMP 4.43 - 4.72)	Arterial	945	905	37	35	A	B
Norpac to Oregon Way (SRMP 4.72 - 6.05)	Arterial	930	930	38	41	A	A
3 <sup>rd</sup> Avenue U-xing to Tennant Way on-ramp from 3rd Avenue (SRMP 7.64 - 8.17)	2 lane	760	960	--	--	E	E
Tennant Way on-ramp from 3rd Avenue to Bypass Merge (SRMP 8.17 - 9.21)	Multilane	1,340	1,285	55	55	B	B
Bypass Merge to Dike Road (SRMP 9.21 - 9.38)	Multilane	2,390	2,320	55	55	C	C
Dike Road to Cowlitz River Bridge (SRMP 9.38 - 9.58)	Multilane	2,185	2,470	55	55	C	C

Source: Analysis by Parametrix using 2017 PM peak hour forecasts for the Build condition and based on methodologies in the *1997 Highway Capacity Manual*.

Note: LOS means level of service.

levels of service to a borderline “D/E” condition. However, due to uncertainty involved in these long-term projections and the marginal nature of the impact, it is not recommended that improvements be undertaken in this segment in conjunction with the bypass. It is recommended that this highway segment be further considered after completion of the bypass when actual traffic diversion from SR-4 and other parallel routes can be observed.

Several portions of the existing roadway in this segment may be outside of the existing

right-of-way. These are at station 100+00 lt., station 109+00 lt., and station 129+80 rt. Through prescriptive rights, WSDOT controls the area that must be maintained to preserve the integrity of the roadway, which would be the back of ditch or the end of each drainage structure. Additional right-of-way should not be required until or unless the roadway is widened at some point in the future. Existing shoulder width varies from 6 to 9 feet with some 3-foot sections. Future roadway improvement projects should incorporate a uniform 8-foot shoulder.

**Table 24**  
**2017 PM Peak Hour Intersection Levels of Service**  
**Baseline Conditions and Recommended Improvement Package**

Signalized Intersections							
No.   Intersection		2017 Baseline		2017 Recommended			
		Avg. Delay (sec.)	LOS	Avg. Delay (sec.)	LOS		
1	SR-432/SR-4	21.7	C	18.2	B		
4	SR-432/38th Avenue	20.4	C	21.1	C		
5	SR-432/Prudential Blvd.	14.1	B	9.6	A		
7	SR-432/Washington Way	36.1	C	42.4	D		
8	SR-432/Weyerhauser-Norpac Entry/Exit (SRMP 4.72)	N/A	N/A	9.6	A		
11	SR-432/Oregon Way	70.9	E	24.4	C		
12	SR-432/Columbia Blvd.	16.1	B	17.7	B		
13	SR-432/International Way	7.4	A	7.2	A		
14	SR-432/Fibre Way	22.8	C	17.5	B		
15	SR-432/California Way	20.1	C	23.7	C		
16	SR-432/Industrial Way	15.1	B	11.8	B		
18	SR-432 Tennant Way WB off ramp/3rd Avenue	>80.0	F	43.3	D		
21	SR-432 (Industrial Way)/Industrial Way Bypass	N/A	N/A	13.8	B		
22	Oregon Way/Industrial Way Bypass	N/A	N/A	24.6	C		
Unsignalized Intersections							
Intersection		Approach	Avg. Delay (sec.)	LOS	Approach	Avg. Delay (sec.)	LOS
2	SR-432/Mt. Solo Road (SRMP 1.21)	SB EBL	17.5 4.8	C A	SB EBL	21.9 4.8	D A
3	SR-432/Memorial Park Drive (SRMP 2.78)	SBLR EBL	9.9 4.4	B A	SBLR EBL	11.2 4.7	C A

Source: Unpublished analysis developed for the *SR-432 Route Development Plan*, Parametrix, Inc.

Note 1: LOS means Level of Service.

Note 2: Intersections on Industrial Way between Oregon Way and 3<sup>rd</sup> Avenue were analyzed using TRANSYT 7F signal progression software.

Note 3: At intersections denoted N/A under “Average Delay” and “LOS” have been modified between the 2017 baseline conditions and the 2017 recommended plan. In some instances the intersection has been signalized, in others the intersection has either been added to the system or eliminated.



**Table 24 Continued**  
**2017 PM Peak Hour Intersection Levels of Service**  
**Baseline Conditions and Recommended Improvement Package**

<b>Unsignalized Intersections</b>							
<b>No.</b>	<b>Intersection</b>	<b>2017 Baseline</b>			<b>2017 Recommended</b>		
		<b>Approach</b>	<b>Avg. Delay (sec.)</b>	<b>LOS</b>	<b>Approach</b>	<b>Avg. Delay (sec.)</b>	<b>LOS</b>
6	SR-432/Weyerhaeuser Pulp Gate/Interlox (SRMP 3.88)	NB	>45	F	NB	N/A	N/A
		SB	>45	F	SB	>45	F
		WBL	5.4	B	WBL	7.7	B
8	SR-432/Weyerhaeuser-Norpac Entry/Exit (SRMP 4.72)	NB	>45	F		N/A	N/A
		WBL	4.5	A			
9	SR-432/Weyerhaeuser/Douglas Street (SRMP 4.85)	NB	>45	F	NB	>45	F
		SB	29.9	D	SB	>45	F
		EBL	5.5	B	EBL	6.2	B
		WBL	4.7	A	WBL	6.0	B
10	SR-432/Weyerhaeuser-Norpac Entry/Exit (SRMP 5.95)	NB	>45	F	NB	>45	F
		WBL	7.0	B	WBL	7.4	B
17	SR-432 Tennant Way EB ramps/ 3rd Avenue	EBL	>45	F	EBL	>45	F
		EBR	6.3	B	EBR	4.9	A

Source: Unpublished analysis developed for the *SR-432 Route Development Plan*, Parametrix, Inc.

Note 1: LOS means Level of Service.

Note 2: Intersection on Industrial Way between Oregon Way and 3<sup>rd</sup> Avenue were analyzed using TRANSYT 7F signal progression software.

Note 3: At intersections denoted N/A under “Average Delay” and “LOS” have been modified between the 2017 baseline conditions and the 2017 recommended plan. In some instances the intersection has been signalized, in others the intersection has either been added to the system or eliminated.

## **Segment 2 - 38<sup>th</sup> Avenue to West of Oregon Way**

Analysis of 2017 baseline PM peak hour intersection and roadway levels of service identified the following deficiencies in this section:

- SR-432/Weyerhaeuser Pulp Gate (SRMP 3.88) – LOS F for northbound and southbound movements from the minor streets
- SR-432/Norpac (SRMP 4.72) – LOS F for northbound movement

- SR-432/Weyerhaeuser/Douglas Street (SRMP 4.85) – LOS F for northbound movement

Roadway improvements for this section are shown on Figures 12A and 12B and include the following:

1. Relocation of the Weyerhaeuser Pulp Gate Access currently located at SRMP 3.88 is recommended to be relocated to form the southerly leg of the existing signalized intersection with Prudential Boulevard (SRMP 3.84). The existing approach opposite Interlox is not proposed to be signalized due to low

traffic volumes and proximity to the signal at Prudential Boulevard.

2. A second westbound through lane is proposed to be added at the Washington Way intersection to improve east-west traffic flow through this intersection.
3. The existing intersection at Weyerhaeuser/Norpac (SRMP 4.72) is stop sign-controlled for side street movements and will experience poor levels of service as through traffic volumes increase on SR-432. A signal warrant analysis was conducted based on 2017 PM peak hour traffic volumes. This analysis indicated that peak hour warrants would likely be met at this location, and accordingly, signalization was recommended.

At two locations in this segment, side street traffic volumes are not anticipated to be sufficiently high to trigger signalization or other improvement to projected LOS F conditions during the 2017 PM peak hour. These are located at SRMP 3.88 for the southbound egress from Interlox, and at SRMP 4.85 for the northbound egress from Weyerhaeuser opposite Douglas Street. At the Interlox intersection, no mitigation is reasonably available. At the Weyerhaeuser location, consideration should be given to consolidation of this driveway's function with a signalized access point or to the use of the driveway primarily for right turn egress only (right and left turn entrance could be provided at acceptable levels of service).

These proposed improvements address all of the deficiencies identified in the analysis of 2017 PM peak hour conditions with or without the addition of the Industrial Way Bypass further east. As improvements are made in this segment of the corridor

existing sub-standard roadway shoulders should be widened to meet the current 8-foot standard. The addition of bicycle facilities and/or sidewalks is not recommended.

### ***Segment 3 - West of Oregon Way to Tennant Way***

Several locations were identified where improvements would be necessary to address PM peak hour congestion and circulation problems with the 2017 baseline condition. These locations include:

- SR-432/Weyerhaeuser/Norpac (SRMP 5.95) – LOS F for northbound movement.
- SR-432/Oregon Way (SRMP 6.10) – LOS E overall with some movements at LOS F
- SR-432/Tennant Way eastbound ramps to 3<sup>rd</sup> Avenue – LOS F for eastbound left turns onto 3<sup>rd</sup> Avenue
- SR-432 under Tennant Way between the east- and westbound ramps – LOS E
- SR-432/Tennant Way westbound ramps to 3<sup>rd</sup> Avenue – LOS F for overall intersection

To address the deficiencies in this segment, short- and long-term improvements have been recommended. In the short-term, improvements are recommended along Industrial Way/3<sup>rd</sup> Avenue between Oregon Way and Tennant Way. These include: improvements to signal progression along this street, addition of a second westbound left turn lane at the intersection of the Tennant Way westbound ramp with 3<sup>rd</sup> Avenue to accommodate existing high peak hour volumes at this location, and the provision of two-way left turn channelization along Industrial Way between Oregon Way and Columbia Way. Proposed dual westbound

left turn lane improvements at Tennant Way/3<sup>rd</sup> Avenue are illustrated in Figure 13. Two-way left turn channelization improvements along Industrial Way between Oregon and Columbia Way are presented in Figure 14.

To address the long-term deficiencies a new, two-lane limited access roadway is proposed north of and parallel to Industrial Way connecting Industrial Way just west of Oregon Way with Tennant Way, east of 3<sup>d</sup> Avenue. Proposed improvements are shown on Figures 16A through 16D. The Bypass will be grade-separated at Oregon Way and from California Way to Tennant Way, providing a roadway with no at-grade intersections or rail crossings. The Bypass will connect to Tennant Way via a westbound off ramp and an eastbound on ramp. The existing Weyerhaeuser/Norpac approach just west of Oregon Way (SRMP 5.95) will be relocated to west of the Bypass/Industrial Way connection so traffic from this approach can access the Bypass.

#### ***Segment 4 - Tennant Way - 3<sup>d</sup> Avenue to Cowlitz River***

There are no level of service deficiencies identified for this segment of the SR-432 corridor. This portion of SR-432 is designated as an Urban Freeway/Expressway, providing limited access and high speed service. Connections to and from this type of facility should only be at interchange facilities. There is an existing limited access, at grade intersection at SRMP.8.63 that serves Lakeside Industries and connects to a frontage road paralleling SR-432 along the north side. This frontage road also has alternative access to SR-432 via the Dike Road interchange to the east. As volumes on this section of SR-432 continue to increase, this intersection will likely become a greater operational and safety concern. Local roadway improvements that

will lead to closure of this intersection should be pursued.

There is also an existing at-grade rail crossing in this segment of SR-432 at SRMP 8.54. This rail spur line connects the Cytec industrial site with the Longview switching yard and currently carries very low rail traffic volumes. As a part of the Industrial Way Bypass project, this grade crossing will be relocated further west to eliminate the rail/highway conflict for state highway traffic using the Industrial Way Bypass. Traffic continuing further west on Tennant Way toward 3<sup>d</sup> Avenue would still need to cross this relocated trackway.

#### ***Segment 5 - Tennant Way, Cowlitz River to I-5***

This segment of the SR-432 corridor includes the only currently deficient portion of this state highway, based on analysis of existing design hourly traffic volumes. This deficiency is the westbound weaving area between the I-5 southbound off-ramp to westbound SR-432, and the westbound SR-432 off-ramp to Talley Way. This weaving area is less than 600-feet in length and currently operates at LOS E. By 2017, this location and other in the segment will likely experience LOS E and/or F conditions during peak travel periods. Deficiencies in the 2017 baseline condition are as follows:

- SR-432/Talley Way westbound ramp termini intersection – LOS F for traffic exiting the off-ramp onto Talley Way
- SR-432, I-5 to Talley Way westbound - LOS F in the weaving area, LOS E in the non-weaving area
- SR-432, I-5 to Talley Way eastbound - LOS E in the weaving area, LOS F in the non-weaving area

- I-5 off-ramp at Old Highway 99 – LOS F for east and westbound traffic at the intersection, including traffic exiting I-5

Due to potential land use, right-of-way and environmental impacts and cost-effectiveness considerations, as well as potential impacts on I-5 traffic, it is recommended that further evaluation be

conducted of the I-5/SR-432 interchange are through preparation of an Added Access Decision Report. The recommendation is discussed in greater detail in Chapter 8 under “Next Steps”.

## CHAPTER 6

### ENVIRONMENTAL AND ROADSIDE PRESERVATION

This environmental screening was prepared to provide an overview of existing environmental conditions and to identify possible issues or concerns with respect to the recommended highway improvements. Key environmental issues identified in the SR-432 corridor that could have bearing on implementation of corridor improvements include:

- Wetlands
- Floodplains
- Fish and wildlife
- Hazardous materials sites

These issues and others were considered as part of the analysis and evaluation process undertaken to select the recommended improvement package or to identify issues requiring further analysis. A discussion of each significant environmental issue is presented below, with specific information organized by roadway segment where relevant. Following this discussion is an overview of other environmental factors that are considered to be of minor importance in relation to corridor improvements.

#### **WETLANDS**

Existing wetlands and potential wetland impacts associated with corridor improvements are discussed below and approximate locations are shown in Figure 18. Discussion is organized by roadway segment and proposed improvement including:

- Segment 2 – 38<sup>th</sup> Avenue to west of Oregon Way

- Segment 3 – West of Oregon Way to Tennant Way in Vicinity of Industrial Way Bypass
- Segment 5 – Vicinity of I-5/SR-432/Talley Way interchanges

#### **Segment 2 – 38<sup>th</sup> Avenue to West of Oregon Way**

Wetlands identified within the vicinity of the proposed spot roadway improvements recommended in Segment 2 include: Riverine (drainage ditches) and Palustrine Forested/Scrub-Shrub/Emergent wetlands. These existing wetlands are described below.

A large drainage ditch, Ditch No. 3, runs parallel to Industrial Way from 3<sup>d</sup> Avenue (in roadway segment 2) to Washington Way (near the western end of segment 1). Ditch No. 3 flows in a westerly direction, and has control structures that are used to regulate and control water levels. The ditch has steep banks and the channel ranges in size from approximately 30 to 90 feet in width. The land adjacent to the ditch and along the slopes is mowed and maintained grass. The vegetation in the ditch includes reed canarygrass (*Phalaris arundinacea*), Himalayan blackberry (*Rubus discolor*), *Agrostis* sp., cattails (*Typha* sp.), field horsetail (*Equisetum arvense*), soft rush (*Juncus effusus*), and *Panicum* sp.

Ditch No. 5 is a continuation of Ditch No. 3 west of Washington Way to just west of Prudential Boulevard where it turns and continues northwesterly. The National Wetlands Inventory (NWI) map identified this ditch as a Riverine Lower Perennial,

Open Water, Intermittently Exposed/Permanent Flooded, Excavated (R2OWZx) system where it continues north away from Industrial Way. The ditch then crosses 38<sup>th</sup> Avenue and the water flows into Ditch Nos. 10 and 12 where the water is eventually pumped into the Columbia River.

Ditch No. 3 and Ditch No. 5 are part of a large network of manmade ditches located throughout the Longview area. These ditches were excavated and used to collect stormwater from the adjacent land built on a floodplain and used for industrial and commercial business. The manmade ditches in the Longview area are controlled by the Consolidated Diking Improvement District.

The flow in Ditches 3 and 5 is maintained by culvert pipes at the roadway intersections and earthen berm crossings from along Industrial Way. Several culvert pipes from the surrounding commercial and industrial properties outfall into these systems. The Consolidate Diking Improvement District identified two ditches that connect to Ditch No. 3 in Roadway Segment 2. One is a "Relief Drain" located northeast of the ditch between 25<sup>th</sup> and 26<sup>th</sup> Avenues and collects runoff from an adjacent residential area and overflow from Ditch No. 3. The other is Ditch No. 1 that connects to Ditch No. 3 just east of Washington Way and is classified as a R2OWZ system on the NWI map. This ditch is used for the collection of stormwater runoff from the surrounding properties and overflow from Ditch No. 3. There is a Palustrine Forested Saturated/Semi-Permanently Flooded, Seasonal (PFOY), wetland associated with this ditch that is approximately 75 feet northeast of Ditch No. 3.

Palustrine Emergent, Intermittently Flooded/Temporary Flooded (PEMW) wetlands were identified on the north and south sides of

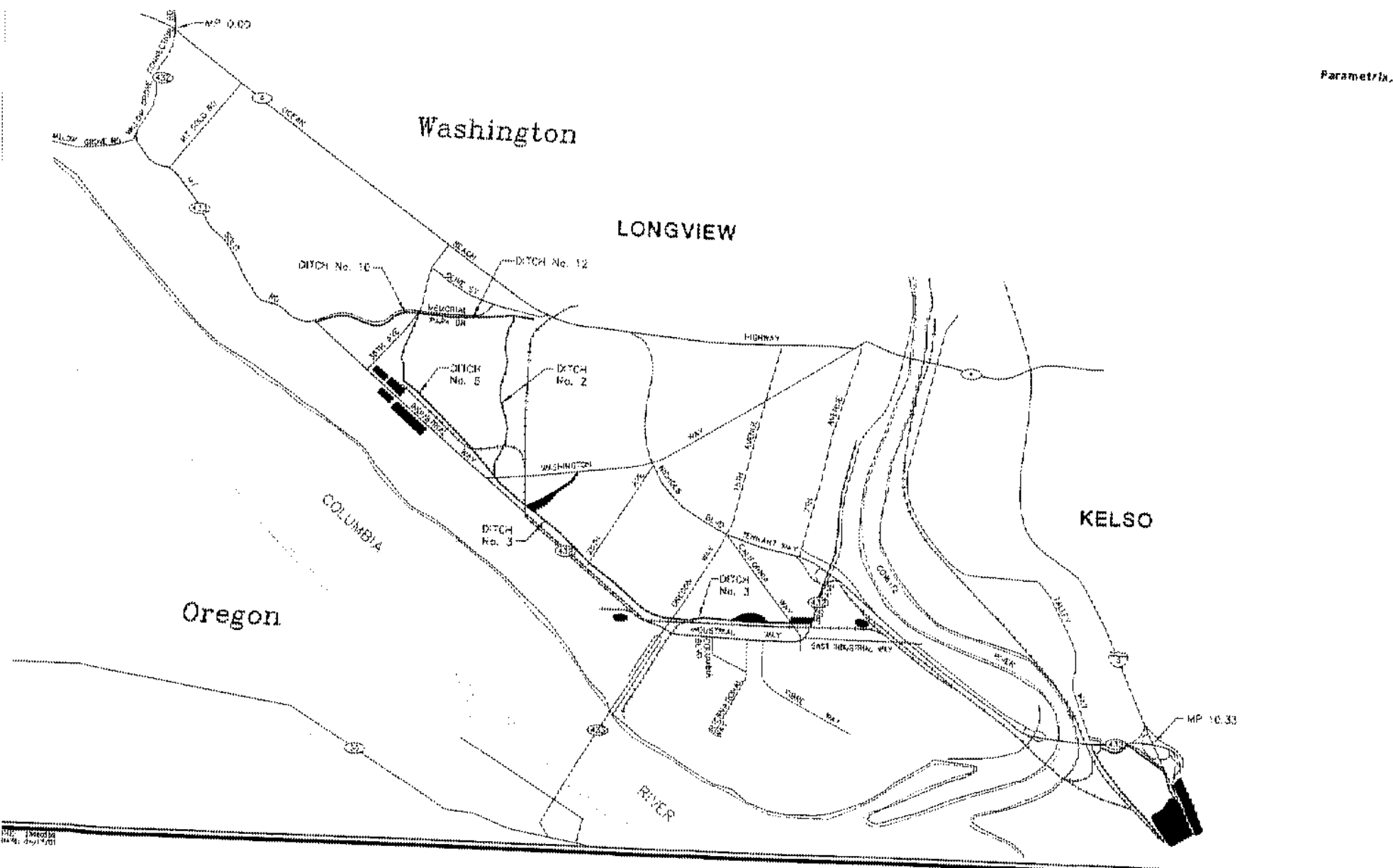
Industrial Way between Prudential Boulevard and 38<sup>th</sup> Avenue. The wetlands south of Industrial Way are located down gradient from an adjacent railroad line. The wetlands north of Industrial Way are located on either side of the substation, between 38<sup>th</sup> Avenue and where Ditch No. 3 turns and continues north. These wetlands were identified on the NWI maps but have been impacted by the industrial and commercial buildings and driveways, railroad tracks, and substation. The wetlands had standing water at the time of the site visit and the predominant vegetation included reed canarygrass, *Salix sp.*, field horsetail, and Himalayan blackberry.

Wetlands potentially impacted by the spot improvements proposed in the portion of the corridor generally west of Oregon Way include:

- Wetlands along the south side of Industrial Way (SR-432) in the vicinity of the Weyerhaeuser Pulp Gate entrance (opposite Interlox) where relocation of the existing private road is proposed to connect with the existing traffic signal-controlled intersection with Prudential Boulevard.
- Some minor wetland impacts may also be experienced with the proposed widening of SR-432 to add a second westbound through lane in the vicinity of the Washington Way intersection.

### ***Segment 3 – West of Oregon Way to Tennant Way in Vicinity of Industrial Way Bypass***

Parametrix, Inc. conducted a field reconnaissance on April 8, 1999 and a review of the National Wetland Inventory maps to identify wetlands within the vicinity of the recommended Industrial Way Bypass



**Figure 18**  
 General Location of Wetlands and Ditches in  
 Vicinity of Recommended Improvements  
 SR 432 ROUTE  
 DEVELOPMENT PLAN

from just west of Oregon Way to Tennant Way. Some of the community types identified included: Riverine (Ditch No. 3), and Palustrine Forested/Scrub-Shrub/Emergent wetland systems and a small manmade drainage ditch. Based on final engineering for the Industrial Way Bypass and conclusions with respect to appropriate modifications to the existing railroad system in the area, some or all of these wetlands could be impacted.

- One small Palustrine Scrub-Shrub/Emergent (PSS/PEM) system was located just west of Tennant Way in the vicinity of the proposed alignment for the Industrial Way Bypass. This area was not identified on the NWI maps; however, hydric soils and hydrology are present.
- The NWI identifies a Palustrine Scrub-Shrub Seasonally Flooded system (PSSC) located on either side of the railroad paralleling Industrial Way between 3<sup>rd</sup> Avenue and California Way. This wetland was identified on the NWI map. The wetland is located within the channel bed of Ditch No. 3 on the north side. The vegetation included black cottonwood (*Populus trichocarpa*), *Salix sp.*, field horsetail, soft rush, *Agrostis sp.*, and *Panicum sp.*
- There is one manmade drainage ditch approximately 1,000 feet in length, 5-feet wide and 1-foot deep that runs parallel to and on the south side of the railroad tracks. This ditch begins where the railroad tracks circle around the Weyerhaeuser property near Tennant Way and terminates at 3<sup>rd</sup> Avenue.
- Ditch No. 3, a manmade drainage ditch excavated from hydric soils, parallels the railroad north of Industrial Way between

3<sup>rd</sup> Avenue and approximately Washington Way. The ditch is identified on the NWI map as a Riverine, Lower Perennial, Open Water, Permanent, Excavated (R2OWZx) system.

- A Palustrine Forested/Scrub-Shrub wetland is located west of the trailer park adjacent to the California Way/Industrial Way intersection. This wetland was identified on the NWI map as a Palustrine Forested Seasonal (PFOC) system. This system is immediately north of Ditch No. 3 and is approximately 800 feet in length and was dominated by black cottonwood, and Himalayan blackberry.
- An open water system that appears to be a stormwater pond is located in the southwest corner of the Industrial Way/Port Way intersection (next to the southwest quadrant of the Industrial Way/Oregon Way intersection). The pond is located approximately 15 feet south of Industrial Way and runs parallel to the roadway for approximately 280 feet. This wetland was identified on the NWI map as a Palustrine Open Water Permanent (POWH) system.
- An area in the southwest corner of the Oregon Way/Industrial Way intersection was targeted for review to identify the potential presence of wetlands. This area is on Weyerhaeuser property enclosed by a fence and was not accessible at the time of the field review. No wetlands were identified on the NWI map in this location, but the soils are mapped as hydric. The vegetation consists of a black cottonwood stand with a few scattered Douglas fir trees and the area appears to receive



stormwater runoff from the area. The exact extent of wetlands, if any, is not known and should be further investigated during project engineering.

### ***Segment 5 – Vicinity of I-5/SR-432/Talley Way Interchanges***

Wetlands that could be impacted by improvements in the vicinity of the SR-432 interchanges with I-5 and Talley Way are discussed in the paragraphs below.

#### ***East Side of I-5***

Old Highway 99 south of the I-5/SR-432 interchange was evaluated to identify possible wetlands that might be affected by some of the proposed improvement options considered in this area. Particular consideration was given to the options that included a proposed bridge crossing to connect Old Highway 99 with an extension of Talley Way. The east side of Old Highway 99 is adjacent to a steep slope and there are no potential wetlands issues. The west side of the road has a steep vertical drop to a large wetland community. The area between Old Highway 99 and I-5 is predominately wetland with the exception of a small upland parcel used for a Recreational Vehicle (RV) sales office. There are no shoulders on the road except for a few vehicle turnout areas and elevation drop to the wetland is about 5 to 8 feet from the edge of pavement.

The wetlands located between Old Highway 99 and I-5 include open water and Palustrine Forested/Scrub-Shrub/Emergent community types. The NWI map identifies these areas as a seasonally flooded Palustrine Emergent/Scrub-Shrub system. Changes in hydrology due to construction and the filling of wetlands in the surrounding area may have altered these systems over time.

Any widening and realignment of the I-5 northbound off-ramp and Old Highway 99 intersection would potentially impact a Palustrine Forested/Scrub-Shrub community. This wetland is disturbed and dominated by nuisance species. It has been affected by past roadway construction and fill for the adjacent RV sales office. This wetland connects to the open water system to the south by an 8-foot wide ditch that runs behind the RV sales office, parallel to the I-5 off ramp.

The approximate alignment of the proposed bridge crossing was evaluated to identify potential wetland issues. The distance from Old Highway 99 west to I-5 is approximately 400 feet including, 225 feet of open water, 150 feet of Palustrine Forested wetland, and 25 feet of Scrub-Shrub wetland. The proposed alignment will potentially impact a portion of the Palustrine Forested system with several large trees adjacent to Old Highway 99. This forested system then transitions into a Palustrine Scrub-Shrub system and open water body prior to crossing I-5. The extent of the impacts to this wetland system will depend upon the proposed bridge alignment, design and construction.

#### ***West Side of I-5***

On the west side of I-5 and south of SR-432, an extension of Talley Way was incorporated into several improvement options. This area was identified on the NWI map as a Palustrine Forested/Scrub-Shrub/Emergent wetland system. A portion of this area from SR 432 south for approximately 4,000 feet has been used as a disposal site for ash from Mt. St. Helen's eruptions. This area has approximately 10-15 feet of sandy fill material on the surface and appears to be at the same elevation as I-5 to the east and the Burlington Northern

Railroad tracks to the west. None of the three wetland parameters (soils, hydrology, and vegetation) are met in the fill area; therefore, it is not considered a jurisdictional wetland. The dominant plant species in this area is Scot's broom (*Cytisus scoparius*) which is typically found in disturbed upland sites.

The edge of the fill material is surrounded by wetlands located adjacent to the Burlington Northern Railroad tracks, the I-5/SR-432 merge area, and extending southward along the west side of I-5. These wetlands consist of open water and Palustrine Forested/Scrub-Shrub/Emergent wetland communities. A large open water area is located south of where the fill material ends, approximately 4,000 feet from SR-432.

The approximate location of the proposed bridge crossing on the west side of I-5 has a powerline easement and Palustrine Scrub-Shrub/Emergent wetland system to cross over before reaching the west pier of the west bridge abutment in the fill area. The distance of the wetland crossing from I-5 west to the fill material is approximately 175 feet.

### ***Wetlands Mitigation/Permitting Issues***

All the wetlands described above would likely be jurisdictional. Any activity that involves jurisdictional wetlands including culvert extensions would likely require permits and approvals from state, Federal, and possibly local agencies. This includes the Section 404 Clean Water Act permit from the Army Corps of Engineers (Corps) and the Washington Department of Ecology and Section 401 Water Quality Certification.

Mitigation for wetland impacts resulting from the proposed improvements would be

evaluated according to guidelines recommended by the Corps, the Washington Department of Ecology, the Governor's Executive Order related to no net loss of wetlands, and possibly by local city and county agencies. The extent of mitigation is contingent upon the acreage of impacts to wetlands and natural resources.

- Mitigation ratios for Palustrine Forested/Scrub-Shrub/Emergent wetland are expected to range between 1:1 to 3:1, depending upon the community types impacted and the quality of the system. A majority of the wetlands identified within the study area were Palustrine Emergent systems, which are typically mitigated at a ratio of 1:1 to 2:1. Impacts to open water systems may be approximately 2:1. Ratios may be slightly lower for disturbed wetland communities.
- The Seattle District Corps was contacted to discuss the potential mitigation requirements for potential impacts to manmade drainage ditches excavated from hydric soils. The Corps' representative, familiar with the ditch system in the Longview area, indicated that a ratio of 1:1 for an In-Kind Compensation would be a likely scenario. The Corp's representative was also contacted to discuss the regulation of historic wetlands that have been filled with disposal of Mt. St. Helen ash. The Corps' representative (Jack Gossit, June 14, 1999) indicated that if the area did not meet the three wetland parameters (i.e. soils, vegetation and hydrology), it would not be considered jurisdictional.

No mitigation ratios for other wetland systems were discussed at this time.

## **FLOODPLAINS**

Based on a review of GIS mapping resources available from Cowlitz County, the 100-year floodplain appears to be limited to the area of Ditch Number 3 north of and paralleling Industrial Way and the pond near the southwest quadrant of the Oregon Way/Industrial Way intersection. The proposed Industrial Way Bypass could potentially impact the floodplain and this would need to be addressed during project development environmental review and engineering.

## **FISH AND WILDLIFE**

The study area is relatively developed and includes commercial, industrial and residential land uses. The habitats are characterized by mowed and maintained grass, a series of manmade drainage ditches, and Palustrine Forested/Scrub-Shrub/Emergent wetland systems. The habitats identified were used by a variety of species of songbirds, hawks, small mammals, beaver, ducks, and resident fish species such as catfish and carp.

The network of drainage ditches located with the greater Longview/Kelso area, including Ditch Number 3, are ultimately pumped into the Columbia River. According to a representative of the consolidated Diking Improvement District, the pumps on the control structures at the Columbia River outfalls do not allow fish to swim from the river into the drainage ditches.

Identification of potential presence of listed species within the project area would require compliance with Section 7 of the Endangered Species Act. The U.S. Fish and Wildlife Service (USFWS) and National Marine

Fisheries Service (NMFS), Washington State Department of Fish and Wildlife (WDFW), and the Washington State Department of Natural Resources (DNR) would be consulted to identify potential impacts to threatened, endangered, candidate and/or proposed species. If any listed species are identified, a Biological Assessment (BA) would likely be required.

## **ENVIRONMENTAL HEALTH**

A search of available federal and state databases was conducted to identify potential hazardous material sites within one mile of the SR-432 corridor. Throughout the corridor, there were 44 identified sites where known or suspected hazardous substances have been or are currently used, stored, or improperly disposed. In addition to these mapped sites, there are also 70 orphan entries which cannot be mapped (i.e., there is insufficient data to locate the site on a map). Of the 44 mapped locations, 15 sites are located directly adjacent to the existing SR-432 corridor and/or proposed Industrial Way Bypass between Tennant Way and 38<sup>th</sup> Avenue. There are also a number of orphan sites along the corridor. However, the incomplete address information makes it difficult to exactly locate these sites.

Of the 15 mapable sites along the corridor, those with known or suspected groundwater impacts are considered to pose the greatest threat. The fastest migration route for contaminants is generally via groundwater, although surface waters can also be significant migration routes. Sites along the corridor with confirmed or suspected groundwater contamination that might be impacted by recommended improvements include:

- Weyerhaeuser Company
- Reynolds Metals Company Reduction Plant
- Wilson Oil/Chevron Bulk Terminal (south of the southeast quadrant at the Oregon Way/Industrial Way intersection)
- Longview Switching Company (at the east end of Industrial Way near the railroad switching yard)

No sites were identified that constitute a fatal flaw (i.e., a site with known soil and/or groundwater contamination where the location of the contamination is reported as directly adjacent to the corridor). However, the number of mapped sites and orphan sites in the vicinity of the corridor indicate a moderate probability that some degree of soil and/or groundwater contamination along the corridor can be expected.

Initial Site Assessments (ISAs) will be conducted prior to any right-of-way purchase. The ISAs will identify where potential contaminants could exist and will recommend further detailed studies or clean-up plans as required.

Highway capacity improvements in the form of added through lanes and/or new roadway alignments have the potential to increase noise impacts to sensitive receptors above acceptable levels. Project development must provide for noise impact analyses, and must consider practicable abatement treatments. Limited access facilities, with widely spaced access points, offer good mitigation possibilities. Because of the heavily industrial nature of land use in the SR-432 corridor, there are few sensitive receptors that might be impacted by the proposed improvements. There are some mobile homes located immediately north of Ditch Number 3 west of California Way where the

Industrial Way Bypass is proposed to be located. If these homes remain in their current location, some could potentially be impacted by highway noise. There are also existing single-family residential neighborhoods immediately north of the Bypass on the west side of Oregon Way that could also be impacted.

Local governments are encouraged to regulate land development such that noise sensitive land uses are prohibited adjacent to state highways and that developments near highways be planned, designed and constructed in such a manner that noise impacts are minimized.

## **EARTH**

The Soil Survey of Cowlitz County, WA, dated February 1974, identified five soil types within the project vicinity including: Caples silt loam, Caples silty loam, Newberg fine sandy loam, Pilchuck loamy fine sand, and Snohomish silty clay loam. The Caples and Snohomish series were identified as hydric soils.

The soil association identified in this part of Cowlitz County is the Caples-Clato Newberg series typically found on floodplain areas of the Cowlitz and Columbia Rivers that have been cleared and disturbed for industrial and commercial development. The Longview industrial area is predominately built on hydric soils; however, the groundwater table has been effectively drained by the manmade ditch system.

The primary impacts to the earth element associated with the proposed improvements are:

- Increases in the impervious surface between Tennant Way and west of

Oregon Way with the development of the new 2-lane Industrial Way Bypass. Increases will also occur with extension of Talley Way near the SR-432/I-5 interchange, minor widening of Old Highway 99, and the extension of the I-5 northbound off-ramp to provide additional capacity for exiting vehicles and to improve the intersection with Old Highway 99. Other minor increases in impervious surface may also be experienced in the western end of the project area, associated with the recommended spot improvements.

- Erosion will occur due to construction-related clearing and earthwork activities.
- Geologic hazards may be experienced with the proposed improvements at the eastern end of the study area associated with the Old Highway 99 Connector, particularly at the intersections of Old Highway 99 with the I-5 northbound off-ramp and the Talley Way extension.

## **AIR**

SR-432 is not located within a designated Air Quality Non-attainment Area. Proposed improvements are not required to be assessed for regional air quality conformity.

## **VEGETATION**

The plant species identified within the study area are typical of a filled/disturbed vegetative community including Himalayan blackberry (*Rubus discolor*), reed canarygrass (*Phalaris arundinacea*), and Scotch broom (*Cytisus scoparius*). The vegetation associated with the manmade drainage ditches and the wetland systems

included: Douglas fir (*Pseudotsuga menziesii*), black cottonwood (*Populus trichocarpa*), *Salix* sp., red elderberry (*Sambucus racemos*), salmonberry (*Rubus spectabilis*), field horsetail (*Equisetum arvense*), soft rush (*Juncus effusus*), *Agrostis* sp., and *Panicum* sp.

## **ENERGY AND NATURAL RESOURCES**

The only permanent energy resources required for the proposed improvements will be electricity to power intersection illumination and the new signalization systems.

## **LAND AND SHORELINE USE**

Existing and potential future land use in the corridor and the larger metropolitan study area are discussed in Chapters 3 and 4. As noted, existing land use in the corridor is largely heavy industrial including timber and paper processing related services, manufacturing, transportation and distribution including railroads and the Port of Longview, public utilities including substations and drainage facilities, and some retail commercial uses particularly along Industrial Way between 3<sup>rd</sup> Avenue and Oregon Way. Existing zoning along the corridor is illustrated in Figure 19 and includes primarily manufacturing and industrial land uses.

Development patterns in the future are expected to remain largely industrial with over 1,700 acres of new industry anticipated in the corridor (see Figure 9). Some additional highway commercial development is also anticipated in the vicinity of the I-5/SR-432 interchange.

Parasynthetrix, n. sp.

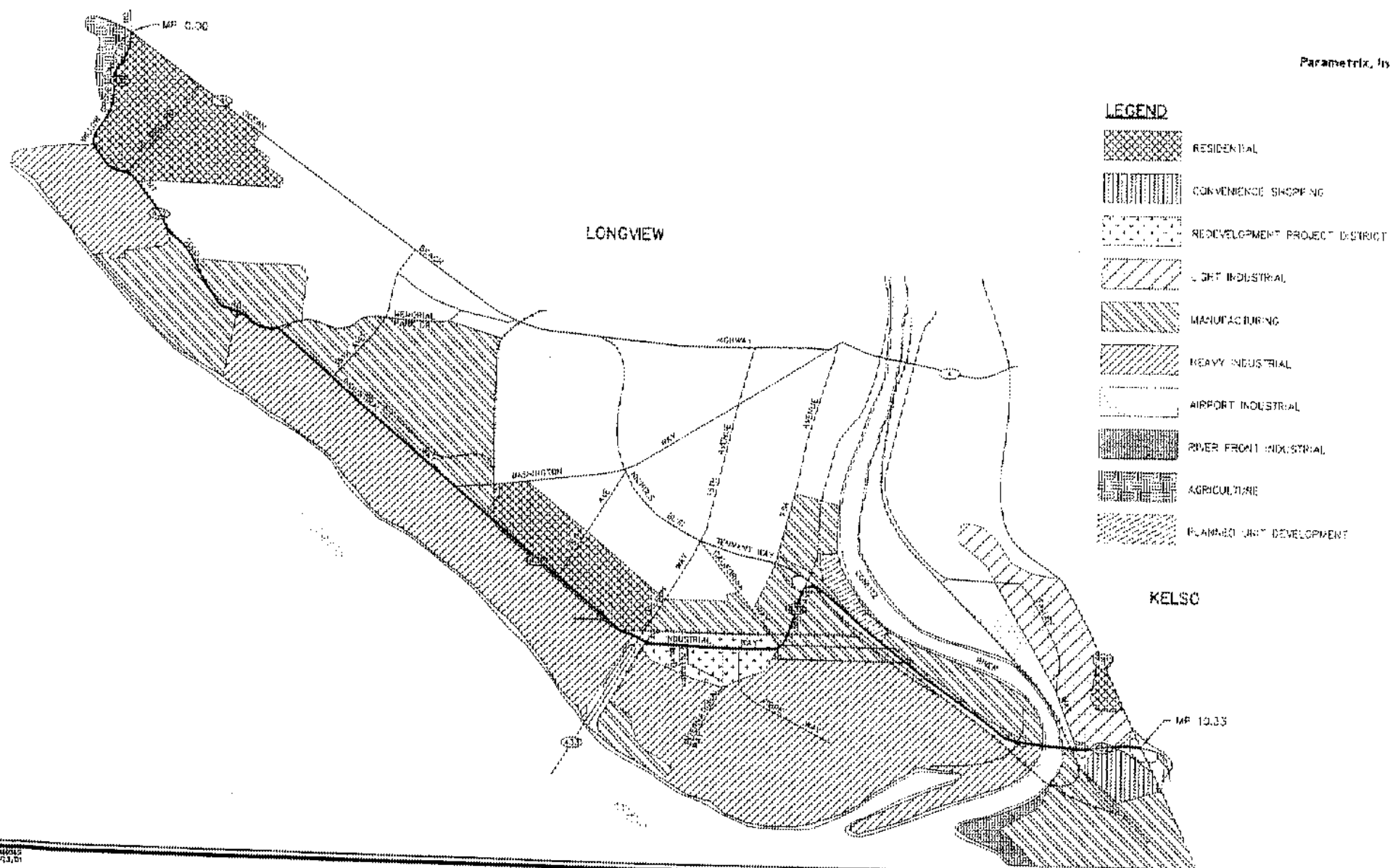
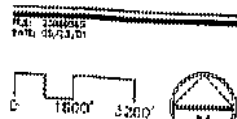


Figure 10  
Existing Generalized Zoning  
in SR-432 Corridor  
SR 432 ROUTE



The proposed improvements are generally compatible with these land uses, although some issues may arise with respect to noise impacts on the residential neighborhood north of the westerly end of the bypass and on a mobile home park located adjacent to Ditch Number 3 and west of California Way (see discussion under “Environmental Health” and “Housing”).

Shorelines within the study area include land in the vicinity of the existing Cowlitz River crossing and along the Coweeman and Columbia Rivers. Based on input from City of Longview staff (Ed DeVries, November 29, 1999), it is not anticipated that there would be any jurisdictional shorelines that would be affected by the improvements recommended in this plan. However, this finding should be further investigated during design engineering and project environmental review.

Any work within jurisdictional shorelines will require compliance with the Shoreline Development Regulations, and a Shoreline Substantial Development Permit, Variance or Exemption. Jurisdictional shorelines include the areas within 200 feet of the Ordinary Highway Water Line for streams and rivers, within 200 feet of Mean Higher High Water for tidal waters, or within the 100-year floodplain associated with the water body.

## **HOUSING/BUSINESS DISPLACEMENTS**

Most of the recommended improvements will not require displacement of existing businesses or residences, with the exception of the following areas:

- Development of the Industrial Way Bypass may require relocation of either

the drainage Ditch Number 3 or the existing Port Lead rail line. If relocation of the ditch is required, some relocation of existing business may be necessary in the vicinity of the proposed Oregon Way interchange and east of Oregon Way to approximately 3<sup>rd</sup> Avenue. A mobile home park is also located in this area on the north side of the ditch, west of California Way. Because of the proximity of these homes to the ditch, some may require relocation depending upon the nature of the ditch modifications necessary to accommodate the Bypass. It is not anticipated that the existing log process yard north of the Port Lead and east of 3<sup>rd</sup> Avenue would require relocation although some right-of-way acquisition will likely be necessary in this area to build the Bypass between Tennant Way and 3<sup>rd</sup> Avenue.

- Development of the Old Highway 99 Connector near the interchange of I-5 and SR-432 will be largely built on vacant land. Preliminary engineering for the Talley Way Extension and I-5 overcrossing approach should be undertaken to identify right-of-way requirements for this portion of the Old Highway 99 Connector project prior to development of the Metrolands property. Relocation of the existing RV sales center in the southeast quadrant of this interchange will likely be necessary to accommodate the proposed modifications to the I-5 northbound off-ramp at this location.

Again, WSDOT encourages local governments to regulate development immediately adjacent to state highways to minimize impacts resulting from anticipated roadway expansions and improvements.

## **AESTHETICS**

The roadside character of the existing highway is largely urban in nature, except between Memorial Park Drive and SR-4, where land uses are largely rural. All recommended improvements will be undertaken in the urban portions of the highway. Visual impacts associated with the significant improvements in the Plan, such as the Industrial Way Bypass and the Old Highway 99 Connector, should be addressed during project design and environmental review.

## **LIGHTING AND GLARE**

The only light produced by the improvements recommended in this Plan will be from traffic signals installed at selected intersections (these would operate day and night), and by highway illumination systems, installed at all channelized or signalized intersections and at other locations as determined during project design (operating at night). Any potential illumination impacts on residential land uses would be shielded. Therefore no potential adverse impacts are anticipated.

## **RECREATION**

SR-432 has some limited recreational use in that it links I-5 with SR-4, the Ocean Beach Highway that leads to the Long Beach Peninsula, and with Oregon 30 that leads to the City of Astoria and the Oregon Coast. Some beneficial impacts may be experienced by recreational travelers to these destinations and others. The proposed improvements outlined in this Plan will have no impact on existing recreational opportunities within the study area.

## **HISTORIC AND CULTURAL PRESERVATION**

Informal surveys of the project area were conducted during the summer of 1999; no potentially eligible historic structures or sites were identified during the field surveys. Much of the land along the highway is currently under industrial or commercial use, and has been disturbed from its original condition. Thus, it is not anticipated that the proposed improvements would impact either cultural or historically significant sites. Correspondence with the State Historic Preservation Officer (SHPO) to identify any potentially eligible historic structures or archaeological sites should be initiated during project development and environmental review.



## CHAPTER 7

### PUBLIC INVOLVEMENT AND CONSISTENCY WITH OTHER PLANS

This chapter provides an overview of the process used to involve local agencies and the public in the development, evaluation and selection of improvement recommendations. Included is a synopsis of the public outreach effort, the development and use of technical and public advisory committees, and the involvement of local decision-makers. Also included in this chapter is a discussion of the consistency of the recommendations of this Plan with the Metropolitan Transportation Plan.

#### **PUBLIC INVOLVEMENT PROCESS**

The public involvement process used in preparing the Route Development Plan involved a two-phased approach that was conducted concurrent with the two phases of the technical study. To a greater or lesser degree, a two-tiered approach was implemented during these two study phases, to effectively coordinate with local agencies and to communicate with the public. This two-tiered approach included the following :

- *Information and Communications:* to provide public feedback opportunities using a web page, media coverage and releases, fact sheets/newsletters, a newspaper insert, and a mounted traveling project display unit for use in public meetings and to leave in public places for review and receipt of comments.
- *Outreach to Stakeholders:* to solicit active involvement in the study by business and industry, transportation (rail and trucking), elected and appointed

officials through Advisory Committee participation, stakeholder meetings, presentations at elected officials workshops, displays and presentations to other groups.

#### **Phase 1 Public Involvement**

The public involvement effort during Phase 1 of the RDP primarily involved coordination with a Technical Advisory Committee (TAC) consisting of representatives of the Cities of Longview and Kelso, Cowlitz County, the Port of Longview, the WSDOT and others. The (TAC) guided the Phase 1 analysis of existing and 2017 future background conditions, and screened initial improvement options to be carried over for further analysis in Phase 2. A corridor stakeholders mailing list was also established and periodic updates were disseminated through existing CWCOC publications. This stakeholders mailing list included the major industries along SR-432 such as Weyerhaeuser, Reynolds Aluminum, Longview Fibre and other, as well as smaller distribution/supplier or retail commercial businesses, land owners, and trucking firms within or using the corridor. Two meetings with corridor stakeholders were held during Phase 1 to solicit public input of key issues or concerns at the outset of the study, and to discuss key findings with respect to major system problems identified through the technical analysis and to initiate identification of improvement options.

#### **Phase 2 Public Involvement**

The Phase 2 public involvement effort was structured around a decision-making process that built upon the Phase 1 effort and results.

This effort was focused on providing information and seeking advice from local agency representatives and corridor stakeholders using methods that increased both the opportunity for involvement and the number of participants. Public information efforts undertaken with Phase 2 included the following:

1. *Web Page* – the CWCOCG has used its web page to provide and receive information on the SR-432 project. Linkages exist between this web page and web sites for other agencies involved in the study, as well as to the feasibility study for replacement of the Lewis and Clark Bridge (SR-433) undertaken concurrent with the RDP.
2. *E-Mail* - the CWCOCG's e-mail address was made available through the web page and by other means and the public was invited to comment and ask questions as the study progressed.
3. *Media Coverage* - in addition to media coverage at workshops with elected officials, media briefings and news releases occurred at key points in the study process.
4. *Newspaper Insert* - the consultant team prepared an insert for distribution by the local newspaper, the *Daily News Business Journal*.
5. *Fact Sheet* - an initial fact sheet was developed to describe the Phase 1 study results and outline the scope and intent of Phase 2. This fact sheet was used as a hand-out at public meetings and presentations, was distributed to the COG's public mailing lists, and was generally made available to the public through a variety of other

means. Copies of study newsletters and the fact sheet are included in Appendix D.

6. *Newsletters* – three project newsletters have been prepared to describe the progress of the study. The first newsletter discussed the results of Phase 1 and outlined the analysis to be undertaken in Phase 2. The second newsletter described the improvement alternatives under consideration. The third newsletter presented the conclusions of the study. The newsletters also announced meetings and agendas, and provide other information and feedback opportunities.
7. *Study Display*- A portable display was developed to illustrate the study process, findings, conclusions and recommendations. This display could be set up on-site for major employers and at public locations, union halls, bank lobbies, etc. A comment sheet holder is incorporated into the display to provide written materials and provide a place to deposit written input. The display and written materials (including the fact sheets/newsletters) has also been used in public presentations and discussions with business and community groups.

Public consultation efforts that have been undertaken as part of the RDP process include the following:

1. *Technical Advisory Committee (TAC)* - The TAC established for and used during Phase 1 was expanded in Phase 2 to include additional local agency representation (representation included the cities, county, port, WSDOT, the

drainage district, and other affected agencies). This committee met several times at key decision-making points during the planning study to provide overall technical direction and feedback on the analysis of deficiencies and alternative solutions.

2. *Stakeholder Advisory Committee* – A project advisory committee was formed with representation from large industries in the corridor, trucking firms, supplier/distributor firms, property owners in the corridor and others affected by existing and potential corridor transportation problems or the identified solutions. This committee met regularly throughout the study to discuss transportation problems, to participate in the development and screening of improvement options, to assess and evaluate improvement alternatives, and to develop recommendations.
3. *Public Open Houses* - All stakeholders along the corridor, as well as the general public were invited to attend two open houses/workshops at key points in the Phase 2 study process, providing opportunities to obtain/discuss information and provide comments/input. Open houses were held during the assessment of improvement alternatives and at the end of the study.
4. *Elected Officials Workshops* - At the conclusion of the Phase 1 study and twice during the Phase 2 study process, workshops were held for elected/appointed officials from the Cities of Longview and Kelso, Cowlitz County and the Port of Longview. The purpose of these workshops was to apprise local decision-makers of the status, findings, conclusions and recommendations of the study.

5. *Other Presentations and Display* – COG staff made several presentations to local clubs, service organizations and others during the course of the study to explain the study process and provide input opportunities.

## **CONSISTENCY WITH METROPOLITAN TRANSPORTATION PLAN**

Chapter 3 and Appendix A provide documentation of the consistency of this RDP with a wide variety of local plans and earlier studies. Of particular importance is the COG's Metropolitan Transportation Plan that sets policy and develops improvement recommendations for the transportation system in the Longview/Kelso/Rainier urban area. This plan was adopted in January of 1997 and updates the 1988 *Longview-Kelso-Rainier Area Comprehensive Transportation Plan*. The updated plan, proposed designation of SR-432 as a National Highway System (NHS) facility, and included the following goals and objectives relevant to the SR-432 Route Development Plan:

- To separate truck traffic from other traffic on routes as direct as possible between I-5 and industrial lands and port facilities in the urban area.
- To route through traffic around the urban area to the extent possible.
- To reduce vehicle/rail conflicts.

The Plan analyzed transportation needs for both the short-term (1997-2002) and long-term (1997-2017), summarized the funding strategy developed for the Allen Street bridge replacement project, and outlined potential funding sources for improvements. The Plan lists projects for the SR-432 corridor that have been evaluated in the SR-432 RDP.

## CHAPTER 8

### FUNDING AND IMPLEMENTATION OF THE RDP

This chapter presents a summary of the action plan for implementation of the recommended improvements in the RDP. Information in the action plan includes a schedule of implementation outlining both a six-year and a twenty-year time package of improvements, including discussion of phasing options for implementation of the larger improvements, particularly the Industrial Way Bypass. This chapter also identifies the relationship of the RDP to *State Highway System Plan* service objectives and the financially-constrained elements of that Plan, identifies improvements to be funded from non-DOT sources as well as opportunities for shared funding responsibility, and lays out a series of “next steps”.

#### **SIX-YEAR IMPROVEMENT PLAN**

In contrast to the predominately long-term orientation of the improvement recommendations in this RDP, this subsection focuses on low-cost improvements that can be implemented within a six-year timeframe. Short-term improvement recommendations are based on evaluation of existing and immediate future safety conditions and traffic operations, and on input from the public, the Stakeholders Advisory Committee, and key local agency representatives.

The recommended short-term improvements are generally low-cost, transportation system management (TSM) measures which can be funded through various revenue sources, including local agency funds, developer and

stakeholder contributions, federal ISTEA grant monies, and state highway improvement funds (where *State Highway System Plan* service objectives are met). It is likely that the affected agencies will need to work together to combine funds from various sources to implement the short-term recommendations.

#### **Summary of Recommended Short-Term Improvements**

Running from I-5 on the east to SR-4 on the west, SR-432 is a total of 10.3 miles long. From 1994 through 1996, the highway had a total of 235 accidents. Over one-third of these accidents occurred in the one-mile section of Industrial Way from Oregon Way to 3<sup>rd</sup> Avenue. This segment has six signalized intersections and over 60 driveways, resulting in a significant amount of side traffic conflict. This segment is not currently designated as a High Accident Corridor based on *State Highway System Plan* criteria. However, in the 2001-2003 Biennium this will change as the intersection of Industrial Way with Oregon Way (SR-432/SR-433) has been identified as a High Accident Location (HAL).

Daily truck percentages along the entire corridor are high, ranging from 15 to 18 percent near SR-4 to over 30 percent in the section between Oregon Way and California Way. Peak period truck activity is also high, constraining traffic operations in the same area that is also impacted by frequent driveway conflicts. Additionally, lack of traffic signal coordination through this segment of the SR-432 corridor, causes frequent starting and stopping operations

that adversely impact overall intersection levels of service and the smooth movement of large vehicles along the highway. Of particular concern is the intersection of 3<sup>rd</sup> Avenue and the westbound Tennant Way ramps. This intersection currently operates at an overall level of service (LOS) D with the northbound left turning movement experiencing more delay, resulting in LOS E conditions for this movement.

Corridor stakeholders expressed a strong interest in improvements within the highway segment between Oregon Way and Tennant Way to reduce congestion, improve local access and overall traffic operations, and reduce the potential for accidents. Because of this interest, short-term improvements focused on the following:

- Traffic signal progression enhancements along the 3<sup>rd</sup> Avenue and Industrial Way corridor.
- Need for dual westbound left turn lanes at the intersection of Tennant Way westbound off-ramp with 3<sup>rd</sup> Avenue to improve traffic operations at this location.
- Adding left-turn channelization on Industrial Way from Columbia Boulevard to Oregon Way where no left turn pockets presently exist.
- Improvements to left turn storage at key intersections along Industrial Way.
- Consideration of access management measures along Industrial Way between 3<sup>rd</sup> Avenue and Oregon Way, ranging from peak period turn movement restrictions to driveway consolidation.

Each of these proposed improvements is discussed in further detail below.

### ***Signal Progression Along Industrial Way***

Implementation of the first short-term improvement – signal progression along Industrial Way from 3<sup>rd</sup> Avenue to Oregon Way – is already underway. A new traffic signal controller was installed by the City of Longview in late August, 1998, in order to operate the two closely-spaced traffic signals on Industrial Way at 3<sup>rd</sup> Avenue and California Way together as a single signal. Previously, separate controllers operated each signal, which made it difficult to allocate sufficient time for vehicles to clear the area between the signals. Frequently vehicles would be able to pass through one intersection of the pair on a green light, but would then immediately need to stop at a red light at the following intersection.

A total of twenty-five accidents were reported at these two intersections from 1994 through 1996, the most recent three-year period available for accident statistics. This was by far the highest accident location along the SR-432 corridor. Most of the accidents were rear-end collisions caused by drivers trying to make it through the second light after the first one turned yellow. The new controller recently installed by the City will ensure adequate clearance time between the intersections for both passenger cars and trucks, which should greatly reduce the number of rear-end collisions.

Both WSDOT and the City of Longview maintain traffic signals along SR-432. The signals on Industrial Way from 3<sup>rd</sup> Avenue to Columbia Boulevard are operated and maintained by the City, while WSDOT operates and maintains the signals at the Tennant Way off-ramp and at Oregon Way. As part of the signalization improvement on Industrial Way, new coordinated signal timing plans will be installed by the City of

Longview for the segment of Industrial Way from 3<sup>rd</sup> Avenue Columbia Way. Combined with the new traffic signal controller at the east end of Industrial Way, the new timing plan will improve traffic flow on SR-432 between Tennant Way/3<sup>rd</sup> Avenue and Industrial Way/Oregon Way.

### ***Westbound Double Left Turn Lanes at Tennant Way/3<sup>rd</sup> Avenue***

The intersection of Tennant Way westbound off-ramp/3<sup>rd</sup> Avenue currently has a single westbound left turn lane. Over 460 vehicles make this left turn during the PM peak hour, including 24 percent truck traffic. As a general “rule of thumb”, double left turn lanes should be considered for left turn volumes over 300 vehicles/hour. Queuing and traffic operations at the intersection are a significant concern with existing volumes. While the SR-432 off-ramp is long enough to provide adequate deceleration, the combination of the queue length and high truck volume require an inordinate share of the signal’s cycle length to accommodate the westbound left turn. While the existing PM peak hour level of service (LOS) at the intersection is generally acceptable (LOS D overall), the northbound left turn is currently experiencing LOS E conditions. By 2017 the intersection is projected to fail (LOS F) without improvements.

Figure 13 in Chapter 5 provides a conceptual illustration of the intersection with a westbound dual left turn lane. There are already two southbound lanes on SR-432 south of the Tennant Way westbound off-ramp to serve as receiving lanes for the proposed dual left turn movement. The improvement would require widening the off-ramp to ensure sufficient turn radii for truck traffic, modifying the traffic signal and revising signing and striping at the intersection. The westbound through traffic

movement at the intersection would be offset between five and ten feet from the acceptance lane on the opposite side of the intersection. Due to the very low westbound through volume (less than 10 vehicles during the PM peak hour), the offset is not expected to be a concern.

With addition of a westbound dual left turn lane, the PM peak hour level of service would remain LOS D with existing (1997) PM peak hour intersection turn movements, but with average delay close to LOS C. With projected 2017 PM peak hour volumes for the No Build Alternative, a westbound dual left turn lane would provide LOS D operations, compared to LOS F without the improvement. An annualized reduction in delay with this improvement was calculated along with a benefit/cost analysis. Annualized delay would be reduced by 107,380 hours in 2017 which translates to a net present value benefit of \$7.84 million over 20 years, assuming an average value per hour of \$10.00 for autos and \$50.00 for trucks, a straight-line increase in calculated delay from 1997 to 2017 and a 4 percent discount factor. With an estimated project cost of \$182,200, the cost/benefit ratio would exceed 31:1.

### ***Left-turn Channelization from Columbia Boulevard to Oregon Way***

The need for protected left turn channelization at the intersection of Industrial Way with Columbia Boulevard was evaluated considering traffic accidents and existing and future traffic volumes. The evaluation summarized below indicates that the accident history alone does not warrant a left turn lane, but a 125-foot left turn lane is warranted based on estimated 2017 AM peak hour traffic volumes.

The intersection of Columbia Boulevard/Industrial Way is the only signalized intersection on Industrial Way without a left turn pocket. It experiences the third highest number of accidents in the corridor, after California Way/3<sup>rd</sup> Avenue/Industrial Way and Oregon Way/Industrial Way. Along Industrial Way between Oregon Way and 3<sup>rd</sup> Avenue, there were ten accidents either at or within the influence area of the Columbia Boulevard/Industrial Way intersection (based on accident data collected from 1993 through 1996). Eight of the ten were rear-end, right angle or sideswipe collisions, the type of accidents that potentially can be corrected with a center left turn pocket or center two-way left turn lane. However, review of the accident reports indicates that only three of the ten accidents could have been prevented with an eastbound left turn lane transitioning into a two-way left turn lane. The other accidents involved vehicles turning right, running red lights, driving too close to trucks to be visible, and colliding with vehicles already queued at a red light.

In addition to traffic accidents, traffic volumes were considered in the evaluation of left turn needs. The WSDOT *Design Manual* does not identify specific guidelines for installation of single direction or continuous two-way left turn lanes, relying upon an assessment of potential for accident prevention, spacing of existing access points, and delays experienced due to mid-block turning traffic. NCHRP Report 279 entitled *Intersection Channelization Design Guide* (published by the Transportation Research Board) identifies criteria for continuous two-way left turn lanes (COTWLTL) along urban highways similar to SR-432. These criteria include:

- Average daily traffic volumes of 10,000 to 20,000 vehicles (current daily volume

along SR-432 between Oregon Way and 3<sup>rd</sup> Avenue to approximately 17,000 vehicles).

- 70 mid-block left turns per 1,000 feet during the peak hour (this has not been measured along SR-432, however, in the section of Industrial Way between Columbia Boulevard and the beginning of the Oregon Way left turn lane taper there are 14 driveways over a distance of about 1,300 feet. In the section between Columbia Boulevard and the beginning of the existing COTWLTL approximately 900 feet to the east there are 13 driveways. If each driveway in these sections received 5 to 6 turning movements during the peak hour, this criterion would be met. As these driveways serve a fast food outlet, a major retail auto supply dealer, and numerous other retail establishments, it is anticipated that this criterion could be easily met).
- Minimum length of the COTWLTL should be 1,000 feet (this criteria would be met as the proposed improvement exceeds this distance and adds onto an existing COTWLTL).

Figure 14 in Chapter 5 depicts a conceptual roadway improvement plan which would provide a Continuous two-way left turn lane between Columbia Boulevard and the Oregon Way westbound left turn taper, a distance of approximately 2,200 feet.

### ***Left Turn Storage Improvements***

Existing left turn storage capacity was reviewed for adequacy at the signalized intersections from Oregon Way/Industrial Way to 3<sup>rd</sup> Avenue/Industrial Way. Vehicle queues were estimated using standard traffic

engineering queuing references<sup>3</sup> for both existing (1997) and projected 2017 PM peak hour volumes. To check potential AM peak hour left turn storage deficiencies, PM peak hour turn movements were inverted (for example, the PM peak hour northbound right turn volume was assumed to equal the westbound left turn volume during the AM peak hour, etc.) and analysis was conducted. A summary of the left turn storage analysis is shown in Table 25.

The most significant left turn storage deficiency is at Fibre Way, where the westbound left turn storage need is estimated at 550 feet during the AM peak hour, compared to a left turn pocket length of about 100 feet. The benefit of restriping to lengthen the left turn pocket needs to be weighed against the impact it would have on driveway access from the west for properties along the north side of Industrial Way immediately east of Fibre Way. There are six driveways within 550 feet of the Fibre Way stop bar. Eastbound left turn access to these driveways would no longer be permitted with a 550-foot left turn pocket. However, access management measures could reduce the impact on access for these properties and provide an overall benefit for traffic movement. Access management is discussed further at the end of this paper. Other locations where left turn storage may not be adequate are shown in bold lettering in Table 27 and listed below.

- The westbound left turn movement at the Oregon Way/Industrial Way intersection

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<sup>3</sup> Institute of Transportation Engineers, *Transportation and Land Use Development*, 1988, Figure 5-14, page 137. An 80-second cycle length was assumed for existing (1997) conditions, and a more conservative 100-second cycle length assumed for 2017 conditions. Heavy vehicle volume percentages were assumed to remain constant.

where the estimated 2017 AM peak hour storage requirement is 475 feet and the PM peak hour storage requirement is 425 feet while the existing storage is 325 feet.

- The eastbound left turn movement at the Oregon Way/Industrial Way intersection, where the estimated 2017 PM peak hour storage requirement is 325 feet and the existing storage is 175 feet.
- The eastbound left turn movement at the Columbia Boulevard/Industrial Way intersection, where the estimated 2017 AM peak hour storage requirement is 200 feet and the PM peak hour storage requirement is 100 feet. There is currently no left-turn storage available at this location.
- The eastbound left turn movement at the California Way/Industrial Way intersection, where estimated 2017 PM peak hour volumes would require 225 feet of storage with only 150 feet available.

It is anticipated that the aforementioned left storage needs can be provided with minor roadway widening and roadway striping revisions.

### ***Access Management Measures Along Industrial Way***

Access management techniques are used to control turning movements to and from driveways and side streets to reduce conflicts and improve traffic flow on the primary street. Typical access management techniques include restricting turns to or from driveways via medians or partial diverters or combining driveways where suitable alternate driveway access is available. Potential access management measures are included in this section chiefly



**Table 25**  
**Industrial Way Left Turn Storage Analysis Summary**

Cross Street	Dir.	Peak Hour Left Turns (1)		Cycle Length (sec.)		Existing Left Turn Storage	Recommended Left Turn Storage (2)		Notes
		1997	2017	1997	2017		1997	2017	
<b><i>AM Peak Hour</i></b>									
Oregon Way	EB	65	100	80	100	175 ft.	75 ft.	150 ft.	Existing pocket adequate.
	WB	330	425	80	100	325 ft.	325 ft.	<b>475 ft.</b>	Existing pocket inadequate by 2017.
Columbia Blvd.	WB	35	155	80	100	0 ft.	50 ft.	<b>200 ft.</b>	Needs pocket to accommodate demand.
International Way	WB	20	90	80	100	175 ft.	50 ft.	125 ft.	Existing pocket adequate.
Fibre Way	WB	340	465	80	100	100 ft.	325 ft.	<b>550 ft.</b>	Existing pocket inadequate by 2017.
California Way	EB	100	100	80	100	150 ft.	150 ft.	150 ft.	Existing pocket adequate.
	WB	15	20	80	100	125 ft.	50 ft.	50 ft.	Existing pocket adequate.
<b><i>PM Peak Hour</i></b>									
Oregon Way	EB	125	295	80	100	175 ft.	150 ft.	<b>325 ft.</b>	Existing pocket inadequate by 2017.
	WB	250	355	80	100	325 ft.	225 ft.	<b>425 ft.</b>	Existing pocket inadequate by 2017.
Columbia Blvd.	WB	15	75	80	100	0 ft.	50 ft.	<b>100 ft.</b>	Needs pocket to accommodate demand.
International Way	WB	25	40	80	100	175 ft.	50 ft.	50 ft.	Existing pocket adequate.
Fibre Way	WB	60	105	80	100	100 ft.	75 ft.	<b>150 ft.</b>	Existing pocket inadequate by 2017.
California Way	EB	145	170	80	100	150 ft.	200 ft.	<b>225 ft.</b>	Existing pocket inadequate by 2017.
	WB	25	40	80	100	125 ft.	50 ft.	50 ft.	Existing pocket adequate.

(1) Based on 2017 No Build Alternative forecasts.

(2) At 90 percent confidence interval.

Note 1: Left turn pocket length estimated using the Institute of Transportation Engineers' *Transportation and Land Development*, Figure 5-14.

Note 2. Evaluation assumed 20 percent truck traffic.

for the benefit of local agency officials and private landowners; they are not part of the Route Development Plan. Implementation of an access management plan should involve affected property owners along Industrial Way.

In the one-mile segment of SR 432 along Industrial Way from 3<sup>rd</sup> Avenue to the railroad crossing east of Oregon Way, there are 53 driveways in approximately 0.75 miles. This section also experienced more accidents than any other one-mile segment of SR 432, with 59 accidents between October, 1992 and August, 1997. Of the 59 accidents, 14 were related to turning movements into or out of driveways. Nearly half (28) were rear-end collisions. The remaining 17 accidents were due to running red lights, improper lane changes, failure to yield to trucks turning right, and other driver errors. Eight accidents recorded west of Columbia Boulevard involved left turns. Drivers passing on the right when trucks were turning right into the Les Schwab Tire Center caused two accidents.

Five of the rear-end collisions were at the intersection of California Way/Industrial Way or 3<sup>rd</sup> Avenue/Industrial Way. The City of Longview recently installed a single traffic signal controller to operate the traffic signals at both intersections, which are about 150 feet apart. As part of the signal installation, signal timing was modified to provide additional time for through traffic to clear the segment of Industrial Way between the two intersections. With the previous signal timing plan, drivers entering the first intersection on a yellow phase had to accelerate to clear the second signal, and would sometimes hit drivers already stopped at the second signal. This situation was most frequent in the westbound direction, because the curvature of the roadway limited visibility of vehicles

already stopped at California Way. Rear end collisions at this location should decrease with additional clearance time between the two intersections programmed in to the new signal timing plan.

WSDOT identifies the need for traffic safety improvements on state highways using a ranking system that factors in the frequency, severity and type of accident to identify High Accident Locations (HALs), for which safety improvements are considered. Based on the 1999-2018 *State Highway System Plan*, there were no High Accident Locations in the Industrial Way segment of SR 432, although, as noted previously, this will change with the 2001-2003 Biennium making State safety funds available to address the safety problem at the intersection of Industrial Way and Oregon Way.

Public input about safe traffic operations along Industrial Way coupled with existing accident experience and the high number of driveways points to a need to consider access management to reduce or better control conflicting traffic movements. Stakeholders who use the corridor regularly identified several access management and safety concerns. Stakeholder concerns include turns to and from the driveways between Columbia Boulevard and Oregon Way, access to the Les Schwab Tire Center across from Columbia Boulevard, left turns at Columbia Boulevard, and left turns at Fibre Way. While the center left turn lane along Industrial Way terminates west of International Way; the issues raised by stakeholders generally relate to the area without a center left turn lane from Columbia Boulevard to the west (see previous discussion related to the installation of a continuous two-way left turn lane in the segment).

The following access management measures are suggestions that could be implemented by local jurisdictions, independently or through the land development permitting process. Another option would be through formation of a local improvement district (LID), which would require the active participation of a majority of affected property owners. Local funding, or a combination of local/state/private funding, could also be used to construct access management improvements. Some of the access management options identified for consideration to help address existing safety concerns and to smooth the flow of traffic along Industrial Way include the following:

- Widen the throat of the eastern driveway at the Les Schwab Tire Center to allow westbound trucks to turn right into the site without requiring that they swing wide enough into the inside westbound through lane to allow cars to pass on the right.
- Consolidate three driveways for the site opposite Columbia Boulevard into a single driveway, with two-way driveway access incorporated into the signal operations. Consider implementing an eastbound left turn pocket as part of the driveway consolidation. Industrial Way has a 100-foot right-of-way west of Columbia Boulevard, which would allow a center left turn lane to be installed without the purchase of additional right-of-way, but would require reconstruction of existing driveways and landscaping.
- Require an eastbound left turn lane to be implemented upon development of the vacant parcel in the northwest quadrant of the International Way/Industrial Way intersection. Continue the left turn lane

as a two-way left turn lane to the western boundary of the undeveloped property.

- Explore the feasibility of a public/private partnership, local improvement district, or other privately financed venture to implement a two-way left turn lane between Oregon Way and International Way.

## **TWENTY-YEAR IMPROVEMENT PLAN**

The 20-year improvement plan for the SR-432 corridor includes the following projects in order of priority or phased implementation:

### ***Industrial Way Bypass***

This project involves constructing a two-lane bypass of existing Industrial Way between Tennant Way and west of Oregon Way. Included in this improvement is completion of the recommended short-term improvements to Industrial Way involving a continuous two-way left turn lane between Columbia Boulevard and the Oregon Way westbound left turn lane taper.

Recommended phasing for the bypass includes an incremental approach designed to facilitate funding of this improvement. While it would be preferable to construct overcrossings of 3<sup>rd</sup> Avenue and California Way at the eastern end of this project from the outset, available financing may preclude this additional cost. Phased improvements include:

1. Construct a two lane, access controlled Bypass between west of Oregon Way to 3<sup>rd</sup> Avenue with at-grade connection to Oregon Way. Relocate Norpac-

Weyerhaeuser entrance at SRMP 5.95 westerly of the new intersection between the Bypass and Industrial Way to facilitate access to the Bypass from this driveway. If not previously constructed, include short-term improvements identified in previous section. Elements of this initial project including pluses and minuses are as follows:

*a) At-grade intersection with Oregon Way*

Pluses: Initial cost savings.

Minuses: Higher future costs due to having to construct the future grade separation under traffic. Adverse impact to levels of service on Oregon Way at both the Bypass and Industrial Way. Lower travel time saving benefit.

*b) Third Avenue to Industrial Bypass -*

The western section of the bypass could be constructed without the direct connection to Tennant Way. The bypass would begin with a new at grade intersection at 3<sup>rd</sup> Avenue, a new at grade rail crossing would be required, and a new at grade intersection would be constructed at California Way.

Pluses: Lower initial cost. Will divert some traffic from Industrial Way.

Minuses: Minimal travel time savings. Additional signalized intersections on 3<sup>rd</sup> Avenue and California Way will increase travel time on these routes. An additional rail crossing will be required. If the Oregon Way/Bypass Intersection is constructed at grade, delay on

Oregon Way will be increased. Higher total project cost due to temporary throw away work and increased cost of future work due to having to construct under traffic. It can be difficult to take away accesses in the future that people have become used to having, for example, access from 3<sup>rd</sup> Avenue to the bypass.

*c) Two Lane Bypass –* according to 20-year traffic analysis, it is not anticipated that more than a two-lane cross-section will be needed for the Industrial Way Bypass, particularly given the capacity limitation of a single directional lane connection to Tennant Way in the ultimate project. Accordingly, the 20-year plan does not recommend a four-lane cross-section. However, over the longer-term, a four-lane cross-section may be necessary, particularly if local access and circulation is provided and at-grade intersections are maintained at California Way and 3<sup>rd</sup> Avenue, and/or if the direct connection to Tennant Way is not made.

Pluses: Lower initial cost. Better use of limited funding. Provides capacity as it is needed, doesn't spend money on capacity that may not be needed until beyond the 20-year planning horizon. May have less impact on the existing ditch.

Minuses: May not be sufficient if local circulation and access is maintained. Construction costs for any future widening work will likely be higher due to having to construct adjacent to traffic.

*2. Complete Bypass between 3<sup>rd</sup> Avenue and Tennant Way including structure*

over Longview Switching Yard and ramp connections to Tennant Way. Provisions for access between the log-storage yard north of the Port Lead track and the log distribution facility south of these tracks will need to be made to facilitate internal circulation of log handling equipment on-site.

Initial construction of this portion of the Bypass could include at-grade connections to 3<sup>rd</sup> Avenue and California Way. This could impact log storage/transfer operations at the site south of Tennant Way and east of 3<sup>rd</sup> Avenue. It may also affect rail operations

a) *Construct Bypass At-Grade from California Way to Tennant Way Overcrossing* - The east end of the bypass could be constructed at-grade rather than as a structure. This would add two rail grade crossings, and signalized grade intersections at California Way and at 3<sup>rd</sup> Avenue. This option would also impact the log storage log operation. An at grade intersection would be required to provide access to the log yard.

Pluses: Lower initial costs. Provides travel time and distance savings benefit over the existing 3<sup>rd</sup> Avenue/Industrial Way Route.

Minuses: With numerous at grade rail crossings and signalized intersections, the full travel time savings benefit of the bypass are not realized. Higher total cost due to throw away temporary work, and having to construct future grade separation under traffic.

3. Grade-separate Bypass over California Way and 3<sup>rd</sup> Avenue to eliminate local connections. This improvement could be made in conjunction with completion of the Bypass between 3<sup>rd</sup> Avenue and Tennant Way.
4. Construct grade-separated interchange on Bypass at Oregon Way.

### ***Relocation of Weyerhaeuser Access to Prudential Boulevard***

This project would also need to be constructed in a single phase as traffic conditions and private access needs and development plans warrant. It is anticipated that most or all of this project will be privately-funded. WSDOT involvement could be limited to work directly on SR-432 (including signal system modifications, signing and striping to accommodate the new southerly leg of the intersection).

### ***Second Westbound Through Lane at Washington Way***

The addition of a second westbound through lane on SR-432 approaching the intersection with Washington Way would add capacity for projected peak hour traffic at this location. This additional capacity would accommodate the projected 2017 PM peak hour turning movements at this intersection at an acceptable level of service. It is anticipated that this improvement would be constructed in a single phase at WSDOT expense.

### ***Signalization of Norpac Intersection (SRMP 4.72)***

Based on analysis of 2017 PM peak hour volumes, this intersection is expected to meet peak hour traffic signal warrants. Signalization has been recommended to

provide an acceptable level of service for side street traffic, particularly that which would be exiting from the Weyerhaeuser/Norpac access location. This improvement would be constructed in a single phase after the expected growth in future traffic volumes satisfies a full warrant analysis. Costs of the improvement could be borne by WSDOT, local agencies and/or private funds.

## **RELATIONSHIP OF IMPROVEMENTS TO STATE HIGHWAY PLAN SERVICE OBJECTIVES**

While SR-432 is a state highway, WSDOT is limited in terms of its ability to finance improvements, both in terms of total available dollars and in terms of the types of projects that can be funded from specific funding programs. These funding programs are categorized by service objective (e.g., mobility, safety, etc.). These service objectives and associated funding programs are discussed in some detail in the *State Highway System Plan* and are summarized below.

1. **Mobility improvements** – projects that add mobility to congested highway corridors and enhance multi-modal transportation. Most of the improvements recommended in the corridor fall into this category. There is a significant funding shortfall for mobility projects on a statewide basis. However, SR-432 is a designated Highway of Statewide Significance and on the statewide Freight and Goods Transportation System which makes it an important candidate for improvements. Improvements to this

highway also can serve to relieve congestion of SR-4.

2. **Safety improvements** – projects funded in this category must meet DOT criteria as a High Accident Location, High Accident Corridor or address a specific transportation safety risk. Based on the analysis conducted for the 1999-2001 biennium, there were no significant accident problems in this corridor. This assessment will change with the analysis that is currently underway for the 2001-2003 biennium which designates that intersection of Industrial Way with Oregon Way (SR-432/SR-433) as a HAL, making the location eligible for safety funding.
3. **Economic Initiatives improvements** – this program assists in providing infrastructure in support of trade or economic development. Like mobility improvements, there is a significant funding shortfall in this program category. However, some of the projects recommended for this corridor might be appropriate candidates for this funding source, given the intermodal and freight-related activities that occur in the study area. Bicycle touring route strategies are also funded under this program and include primarily shoulder widening to a 4-foot minimum.
4. **Environmental Retrofit improvements** – this program exists primarily to solve existing environmental problems in the highway corridor. This would include addressing existing problems with fish passage, storm water discharge, noise problems, etc. It is not anticipated that any projects will be developed in the SR-432 corridor that would fall under this category.

The relationship of the improvements identified in this RDP to the *State Highway System Plan*'s service objectives, and the likely funding sources for the recommended improvements are discussed below.

### ***Mobility (I1)***

Some mobility improvements may be funded by WSDOT with very limited funds. These improvements may also be funded through partnerships with other entities (including local governments, property owners, development districts and others).

#### **Segment 1 – SR-432 Between SR-4 and 38<sup>th</sup> Street**

- No mobility improvements proposed at this time.

#### **Segment 2 – SR-432 Between 38<sup>th</sup> Street and west of Oregon Way**

- Possible participation in the relocation of Weyerhaeuser Pulp Gate Access from Interlox to Prudential Blvd. Improvements outside of State Highway right-of-way should be privately-funded. Signalization/channelization improvements within the highway right-of-way could be funded by WSDOT, local agencies or privately.
- Add westbound lane approaching Washington Way.

#### **Segment 3 – SR-432 Between West of Oregon Way and Tennant Way/3<sup>rd</sup> Avenue Vicinity**

- Construct Industrial Way Bypass
- Relocate Weyerhaeuser/Norpac entry. Improvements outside of State Highway right-of-way should be privately-funded. Signalization/channelization

improvements within the highway right-of-way could be funded by WSDOT, local agencies or privately.

#### **Segment 4 – SR-432 Between Tennant Way/3<sup>rd</sup> Avenue Vicinity and Cowlitz River Bridge**

- No mobility improvements proposed at this time.

#### **Segment 5 – SR-432 Between Cowlitz River Bridge and I-5**

- No mobility improvements proposed at this time. It is recommended that WSDOT and local stakeholders continue to evaluate improvement options to address outstanding deficiencies in this segment through development of an Added Access Decision Report.

### ***Highway Safety (I2)***

The Highway Safety Subprogram is divided in to two subcategories, Collision Reduction and Collision Prevention. These subcategories are discussed below.

#### **Collision Reduction**

This program includes projects to address existing accident problems as established through meeting identified criteria. These include High Accident Locations, High Accident Corridors and Pedestrian Accident Locations. No High Accident Locations (HAL), High Accident Corridors (HAC) or Pedestrian Accident Locations (PAL) were identified for the SR-432 corridor during the 1999-2001 biennium, although this will change for 2001-2003. Based on identification of the new HAL at SR-432/SR-433, a Collision Reduction improvement will be developed.

## Collision Prevention

This program includes funding for projects that meet criteria for risk reduction, safety of the interstate system, removal of at-grade crossings on multi-lane highways, signalization and channelization at high priority intersections, and reduction of pedestrian risk. No Risk Reduction, Interstate Safety, or At-Grade Intersection projects are proposed for this RDP. However, it should be noted that closure of the at-grade intersection at Lakeside Industries on the freeway portion of SR-432 may qualify for funding in the at-grade subcategory if and when there are six or more serious accidents in a three-year period.

The following improvements could be funded out of the Signals and Channelization subcategory:

1. 38<sup>th</sup> Avenue to West of Oregon Way
  - Signalization of the Norpac/Weyerhaeuser driveway at SRMP 4.72
2. West of Oregon Way to Tennant Way
  - Left turn channelization on Industrial Way from Columbia Boulevard to Oregon Way
  - Dual westbound left turn lanes at the intersection of Tennant Way westbound off ramp with 3<sup>rd</sup> Avenue

## **Economic Initiatives (I3)**

As noted in the 1998 State Highway Plan, *“Transportation is critical to the economic vitality of our state. The economic initiatives program contains improvements that support the economy, including improving the movement of freight and goods, partnering to promote economic*

*development and tourism and providing services to travelers.”*

Service objectives for this subprogram that may be applicable to SR-432 include:

1. Reduction of delay to freight on State highways - a specifically applicable program element is:

*Trunk System:* Completion of a four-lane, divided, limited access highway system for high priority freight routes that carry over 10,000,000 tons of freight a year T1 highway class as defined by the Freight Mobility Advisory Committee. Based on data developed in late 1998, SR-432 is currently a T1 highway between Oregon Way and I-5. It is a class T2 highway between Memorial Park Drive and Oregon Way, and a class T3 highway between Memorial Park Drive and SR-4. These classifications would make SR-432 a high priority corridor for freight mobility improvements in those areas where the Industrial Way Bypass improvements are recommended.

2. Highway improvements to enhance economic development and international trade – a specifically applicable program element is:

*Economic Development:* In partnership with public and private entities, this program would make targeted improvements to the state highway system in support of international trade and emergent economic development. As SR-432 serves the Port of Longview, a key facility engaged in international trade in the Lower Columbia River system, the SR-432 corridor offers the opportunity for improvements under this program.



3. Bicycle Touring Route Strategies are also included under the Economic Initiatives program although no improvements are proposed for the SR-432 corridor as the highway is not a designated bicycle touring route.

### ***Environmental Retrofit (I4)***

No improvements in the SR-432 corridor have been identified under this subprogram at this time.

## ***BENEFIT/COST ANALYSIS***

### ***Introduction***

This section documents methodology, data sources and results of the benefit/cost (b/c) analysis for the recommended improvements in the SR-432 Route Development Plan. Included in this assessment are each of the long-range improvements discussed above, as well as the short-term improvement recommended at the intersection of the westbound Tennant Way ramps with 3<sup>rd</sup> Avenue (the costs and benefits of other short-term improvements along Industrial Way are included in the b/c analysis for the Industrial Way Bypass). For purposes of this benefit/cost analysis, assumptions have been made regarding financial participation in each of these projects by WSDOT and by other parties. These assumptions are noted in Table 26. Costs of implementing the projects in this RDP may not be fully borne by WSDOT but instead may be jointly funded.

Improvements discussed in this section include:

- Construction of the two-lane Industrial Way bypass extending from Tennant

Way to Industrial Way west of Oregon Way. Included in this improvement is completion of the two-way left turn lane on Industrial Way between Columbia Boulevard and Oregon Way.

- Adding a second westbound through lane to the east leg of the SR 432/Washington Way intersection.
- Signalizing the Weyerhaeuser/Norpac entrance at SRMP 4.72 on SR-432.
- Adding a south leg to the intersection of SR-432 at Prudential Boulevard, modifying the existing traffic signal to provide protected eastbound and westbound left turns, and closing the existing Weyerhaeuser access immediately east of the Prudential signal on the south side of SR-432.
- Adding a second westbound left turn lane at the intersection of 3<sup>rd</sup> Avenue with the westbound Tennant Way off-ramp.

### ***Methodology***

Cost estimates and benefit calculations were prepared using the benefit/cost (b/c) spreadsheet provided by the WSDOT Southwest Region office. The spreadsheet includes separate worksheets for cost estimates including calculation of present value, travel time benefits associated with intersection, arterial and/or other types of capacity improvements, and safety benefits. Travel time benefits are computed separately for the following areas:

- Climbing lanes
- General purpose freeway capacity improvements
- HOV lanes
- New freeway interchanges
- Intersection capacity improvements

- Two-way left turn lanes
- Arterial capacity improvements

Benefits for the improvements in the SR-432 Route Development Plan were calculated using the worksheets for intersection capacity improvements, two-way left turn lanes, arterial capacity improvements and safety improvements. For each improvement, all applicable benefits were included. For example, the Industrial Way bypass b/c analysis includes a combination of safety benefits along the existing intersections where traffic volume would be reduced, arterial benefits for travel time savings on existing facilities and the bypass, intersection benefits at existing intersections, and two-way left turn lane benefit for the section between Columbia Boulevard and Oregon Way.

The benefit worksheets require the facility segment benefiting from the improvement to be defined. For intersection improvements the segment benefiting from the improvement was determined using conceptual engineering plans. However, the Industrial Way Bypass is expected to produce travel time benefits throughout the Kelso-Longview travelshed. For example, by creating additional east/west capacity, this project would likely draw traffic from Nichols Boulevard that would in turn shift some traffic from SR-4 to Nichols Boulevard, relieving congestion on this other state highway facility.

To assess the system benefits of the Industrial Way Bypass, a comparison of vehicle hours of travel time throughout the metropolitan area was developed using the regional travel demand model. The product of the interzonal travel time matrix and the interzonal trip matrix was calculated for two model runs, Build and No Build conditions. Total regional vehicle travel time for both

scenarios was calculated and compared. The reduction in total vehicle travel with the Build condition represents its areawide travel time benefit and is expressed in terms of vehicle-minutes saved during the PM peak hour.

PM peak hour travel time savings was converted to annual savings assuming 261 weekdays per year and 104 weekends (where daily travel time savings was assumed to represent 75 percent of average weekday travel time savings). A vehicle mix assumption was developed for autos and trucks based on peak hour truck percentages. This represents a conservative assumption in that midday truck percentages are higher than the peak hour percentage. Travel time savings for trucks are valued at \$50/hour, while passenger car savings are valued at \$10/hour. The truck percentage was applied to the total hours of travel savings and multiplied by \$50/hour. The remaining hours were multiplied by \$10/hour to compute passenger vehicle travel time savings.

### **Data Sources**

Traffic data necessary for the b/c analysis included traffic volumes; truck percentages; accidents by type, milepost and frequency; geometric assumptions for intersections and new roadway sections; intersection levels of service, delay and volume-to-capacity ratios; and posted speeds.

In addition to the b/c workbook, the WSDOT Southwest Region office provided baseline data including lane geometry, accident history, posted speeds, peak hour traffic counts at the study intersections, and 24-hour machine counts at various locations along the corridor. Additional information was developed as a part of the RDP to support the b/c analysis including: improvement plans,

cost estimates, future projected PM peak hour traffic volumes, volume-to-capacity ratios, and intersection delay. Projected traffic reductions were also determined for the intersection benefit worksheet. Cost estimates assume public funding for each project except where noted.

## **Results**

Table 26 summarizes the benefit/cost analysis, including a description of the improvement, total present value cost (excluding privately funded portions), safety benefit, intersection benefit, arterial benefit, two-way left turn lane (TWLTL) benefit, and total benefit. The total benefit is the sum of the safety, intersection, arterial and TWLTL benefits, and the benefit/cost ratio is calculated as total benefit divided by total present value cost. Worksheets supporting the information contained in this table have been submitted separately to WSDOT and the CWCOC.

Improvements included in Table 26 are shown in ranked order based on benefit/cost ratio. B/c ratios range from over 30 for a second westbound left turn lane at the Tennant Way westbound off-ramp to 3<sup>rd</sup> Avenue to 1.01 for installation of a traffic signal at the Weyerhaeuser/Norpac entrance. The Industrial Way Bypass generates a b/c ratio of 1.47.

## **RELATIONSHIP TO FINANCIALLY-CONSTRAINED STATE HIGHWAY SYSTEM PLAN**

The financially-constrained element of the 1999-2018 *State Highway System Plan* includes no funding for any improvements along SR-432, although the highway has

been designated as a Highway of Statewide Significance, and is a part of the National Highway System. The eastern portion of this highway has also been designated as T1 route on the State Freight and Goods Movement Transportation System, with T2 and T3 designations along other highway segments. A total ranging from a low of \$73.9 million to a high of \$96.07 million has been identified in the list of Mobility Strategies Excluded from the Constrained Plan. No Safety, Economic Initiatives or Environmental Retrofit funding has been identified for the corridor.

## **NON-DOT FUNDED PROJECTS**

As noted above, any of the improvement projects identified in this RDP could involve non-DOT funding as a part of the overall improvement financing strategy.

## **NEXT STEPS**

A series of future actions have been identified to implement the recommendations outlined in the SR-432 Route Development Plan. These include:

1. Obtain or initiate development of action plans to secure funding for the future improvements
2. Initiate tasks leading to construction of the recommended improvements.
3. Secure funding and initiate development of an Added Access Decision Report to address existing and future deficiencies along SR-432 in the vicinity of the I-5 and Talley Way interchanges.

**Table 26**  
**SR-432 Route Development Plan**  
**Summary of Improvement Recommendations**

<b>Improvement</b>	<b>Rationale</b>	<b>Time Frame</b>	<b>Total Cost</b>	<b>Total Present Value Cost</b>	<b>Total Benefits</b>	<b>Benefit/Cost Ratio</b>
<b><i>Short-Term Improvements</i></b>						
Traffic signal progression along Industrial Way (3 <sup>rd</sup> Avenue to Oregon Way)	To ensure adequate clearance time between intersections reducing rear-end collisions	Underway	\$180,000	--	--	--
Second westbound left turn lane at Tennant Way/3 <sup>rd</sup> Avenue	Improve peak period capacity of intersection	2000-2006	\$182,200	\$182,200	\$5,650,400	31.01
Roadway widening and traffic signal modifications for left turn channelization on Industrial Way (Columbia Blvd to Oregon Way)	Improve safety at intersection and driveways	2000-2006	\$848,400	\$742,266	--	(2)
Restriping for Left Turn Storage Length Improvements, various locations on Industrial Way (3 <sup>rd</sup> Avenue to Oregon Way)	To correct for deficient left turn storage along Industrial Way and improve traffic flow	As needed to accommodate left turning traffic	Nominal	--	--	--
Access management measures, various locations on Industrial Way (3 <sup>rd</sup> Avenue to Oregon Way)	To control turning movements to/from driveways and reduce conflicts with through traffic on Industrial Way	As development opportunities arise	Depends on strategy implemented	--	--	--
<b><i>20-Year Improvement Plan</i></b>						
Prudential Blvd access modifications for Weyerhaeuser	To improve safety and ease of access	2000-2020	\$130,200 (1)	\$31,500	\$124,800	3.96
Industrial Way Bypass (with grade separation over Oregon Way)	To reduce congestion and conflicts between through, local, and rail traffic on Industrial Way	2000-2020	\$66,535,400	\$47,560,000	\$69,714,700	1.47
Second westbound through lane on SR-432 at Washington Way	To add capacity at the intersection	2000-2020	\$413,200	\$378,900	\$496,200	1.31
Install traffic signal at Weyerhaeuser/Norpac entrance (SRMP 4.72)	To provide acceptable level of service for side streets		\$260,600	\$260,600	\$263,000	1.01

(1) WSDOT share of project cost – assumed to include signal modifications and minor intersection channelization improvements.

(2) Benefit/cost analysis for Industrial Way Bypass includes this improvement (Industrial Way widening from Columbia to Oregon).

These action steps are discussed in the following paragraphs.

### ***Secure Funding***

Since SR-432 is a WSDOT facility, all WSDOT funding sources should be pursued. The strategies used will depend very much on the b/c ratios of the individual projects. To the maximum extent possible, private or local funding should also be pursued to raise the calculated b/c ratios and make the projects more competitive on a statewide basis. Additionally, if WSDOT builds the Industrial Way Bypass and the existing SR-432 reverts to local governments, the cost of improvement projects in the existing corridor may be locally funded.

### ***Short-term Funding***

A potential funding source for the short-term improvements is the Safety I2 Subprogram - Signals and Channelization subcategory. In order to be funded in this category, applicable warrants must be met. WSDOT funding for projects from this source could be used as a match for grants, such as STP. If local and private funding sources could be identified, this could be a very competitive grant application for short-term improvements to Industrial Way and/or for some of the recommended longer-term intersection and signalization improvements.

### ***Other Funding***

All other WSDOT mobility and safety funding sources are used to address system deficiencies. The one current deficiency on SR-432 is the westbound weave between I-5 and Talley Way. It is recommended that this deficiency and future deficiencies expected to occur at this location be addressed through an Added Access

Decision Report before funding is budgeted for improvements. Analysis of accident history undertaken for the 2001-2003 biennium indicates that the Oregon Way/SR-432 intersection has become a High Accident Location (HAL). Accordingly, funding for improvements at this location could be sought in the next biennium.

Trade corridor or Freight Mobility funding sources should also be investigated to support improvement projects in the SR-432 corridor. Additionally, consideration should be given to developing options for legislative action. These options could involve both regional and local agencies, as well as private corridor stakeholders.

A briefing paper should be prepared to pursue funding options that outlines:

1. The nature of the recommended improvements.
2. Benefits of the improvements to the community and the statewide transportation system and economy.
3. Costs and cost-effectiveness.
4. Other factors determined to be critical in clarifying the needs of this corridor to legislative and decision-making bodies.

Additionally, local and/or private funding sources should be identified and partnerships formed that can be used to develop a comprehensive and competitive funding package for each improvement.

### ***Tasks Leading to Construction***

Many tasks have been identified that could lead to further advancement of the recommended improvements in the SR-432 corridor. These include:

1. Development of a rail system analysis “booklet” that outlines the options for relocation of the existing Port Lead track. Relocation of this trackage could result in cost-savings for the Industrial Way Bypass due to lower right-of-way costs and could minimize the improvements needed to relocate the drainage ditch adjacent to the proposed project alignment. This booklet should be developed in consultation with Union Pacific, BNSF and Columbia & Cowlitz railroad representatives, as well as the Port of Longview.
2. Initiate preliminary engineering and any necessary environmental review for short-term improvements.
3. As funding becomes available, initiate preliminary engineering and environmental review/permitting for longer-term improvements.

### ***Secure Funding for Added Access Decision Report***

As noted in Chapter 5, none of the alternatives studied for SR-432 in the vicinity of the I-5 and Talley Way interchanges, was able to fully resolve the identified deficiencies. In addition, each had potential natural resource, right-of-way or highway geometric impacts associated with it that made it an unacceptable solution from a state and/or local perspective. A major constraint to improvements in this area is the design of the I-5/SR-432 interchange itself. It is anticipated that any final solution to the

problems at the eastern end of SR-432 must include consideration of interchange modifications that may affect existing access to/from I-5.

At the completion of the SR-432 Route Development Plan, a decision was made by stakeholders to further evaluate the I-5/SR-432 interchange area through preparation of an Added Access Decision Report. Objectives of this analysis include:

1. Resolution of the existing and projected operational deficiencies to reduce delays and vehicular conflicts along SR-432 between the Cowlitz River and I-5 and at the SR-432/I-5 interchange.
2. Resolution of deficient roadway geometrics at and near the I-5/SR-432 interchange.
3. Reduction of negative impacts associated with delays to freight movement between I-5 and the Longview and Kelso industrial corridors consistent with planned or recommended local improvements.

To prepare the Added Access Decision Report, the Cowlitz-Wahkiakum Council of Governments has requested legislative funding for the 2001-2003 Biennium. If funding is obtained, this study could be initiated during the latter half of 2001. The study should be closely coordinated with WSDOT regional and headquarters staff, the Federal Highway Administration (FHWA), and local agencies and stakeholders.